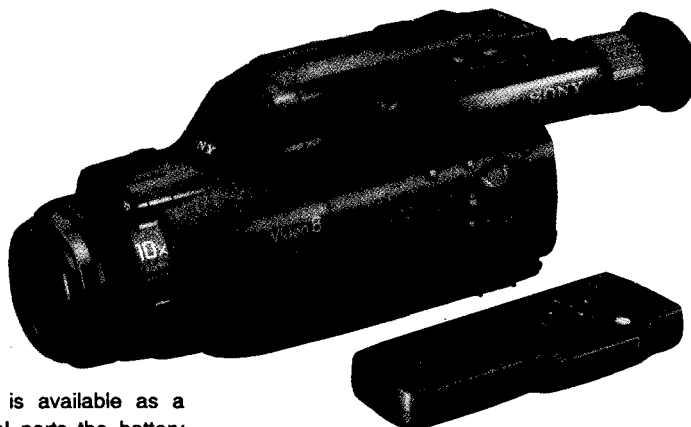


CCD-FX400E

RMT-509

SERVICE MANUAL

AEP Model
UK Model
Australian Model



Remote commander is available as a unit, but as individual parts the battery case lid of commander is only available.

**Video8
Handycam**

A MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

System

Video recording system

Rotary two heads, Helical scanning FM system

Audio recording system

Rotary head, FM system
PAL colour, CCIR standards

Video signal

8 mm video format cassette

Usable cassette

Tape speed

SP mode: Approx.

2.0051 cm/sec.

LP mode: Approx.

1.0058 cm/sec.

Recording/Playback time

SP mode: 1 hour 30 min.
(P5-90)

LP mode: 3 hours (P5-90)

Fast forward/rewind time

Approx. 6 min. 30 sec.
(P5-90)

Image device

CCD (Charge Coupled Device)

Viewfinder

Electronic viewfinder
(black and white)

Lens

Combined 10 × power zoom lens
f=6.1 to 61 mm (1/4 to 2 1/2 inches)
Approx. 44 to 440 mm (1 3/4 to 17 3/8 inches) converted into the focal length of a 35 mm still camera.
F 1.6 with macro
Filter diameter: 37 mm (1 1/2 inches)
TTL autofocus system inner focus wide macro system

Colour temperature AUTO

Minimum illumination 3 lx

Illumination range 3 lx to 100,000 lx
(0.3 to 9294 footcandles)

Recommended illumination

More than 100 lx
(9 footcandles)

Aperture correction

Automatic
With backlight adjustment

Input and output connectors

AEP, UK model

Video output

Phono jack
1 Vp-p, 75 ohms
unbalanced sync negative

Audio output

Phono jack
-7.5 dBs, (at load
impedance 47 kilohms)
impedance less than
1 kilohm

Australian model

Video input/output

Selectable with the INPUT/OUTPUT selector
Phono jack, 1 Vp-p, 75 ohms
unbalanced sync negative

— Continued on next page —



8 VIDEO CAMERA RECORDER
SONY®

Audio input/output	Selectable with the INPUT/OUTPUT selector Phono jack Input: -7.5 dBs, input impedance more than 47 kilohms Output: -7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote  jack	Stereo mini-minijack
MIC jack	Minijack, -66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Wireless Remote Commander

Remote control system

Command mode	Infrared control VTR 2
Power requirements	3 V DC, 2 size AA (R6) batteries
Dimensions	Approx. 48 × 19 × 130 mm (w/h/d) (1 ¹⁵ / ₁₆ × 3/ ₄ × 5 ¹ / ₈ inches)
Mass	Approx. 50 g (1.8 oz) (excluding batteries)

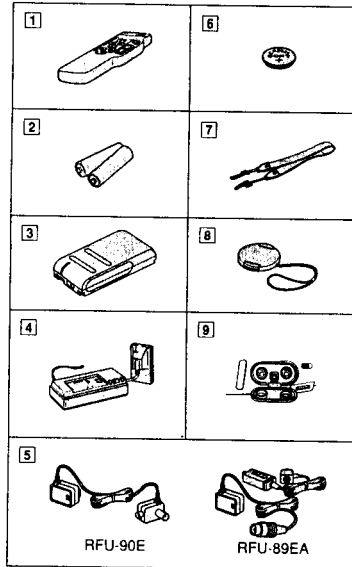
Design and specifications are subject to change without notice.

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	5.7 W (camera recording) including the viewfinder Vertically, horizontally
Installation	Operating temperature 0°C to 40°C (32°F to 104°F) Storage temperature -20°C to +60°C (-4°F to +140°F)
Dimensions	Approx. 118 × 108 × 265 mm (w/h/d) (4 ³ / ₄ × 4 ³ / ₈ × 10 ¹ / ₂ in.)
Mass	Approx. 820 g (1 lb 12 oz) excluding the battery pack, lithium battery, cassette, lens cap, jack cover and shoulder strap Approx. 1060 g (2 lb 5 oz) including the battery pack NP-55H, lithium battery CR2025, cassette P5-90, lens cap, jack cover and shoulder strap
Microphone	Electret condenser microphone, uni-directional, monaural type

Supplied Accessories

(A)



(A)

- 1 Remote Commander (1) (page 6)
- 2 Size AA (R6) battery for Remote Commander (2) (page 6)
- 3 Battery pack NP-55H (1) (page 8)
- 4 AC power adaptor AC-V60A (1) (pages 8, 11)
- 5 RFU adaptor RFU-90E or RFU-89EA (1) (pages 32, 33)
(With the RFU-89EA, an aerial selector and a screwdriver are supplied.)
- 6 Lithium battery CR2025 (1) (page 14)
- 7 Shoulder strap (1) (page 5)
- 8 Lens cap (1) (attached to the camcorder) (page 20)
- 9 Jack cover (1) (attached to the camcorder)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

Part code and part name of the semiconductor for correction of the print board is described in the space of each print figure. Use this list when ordering parts.

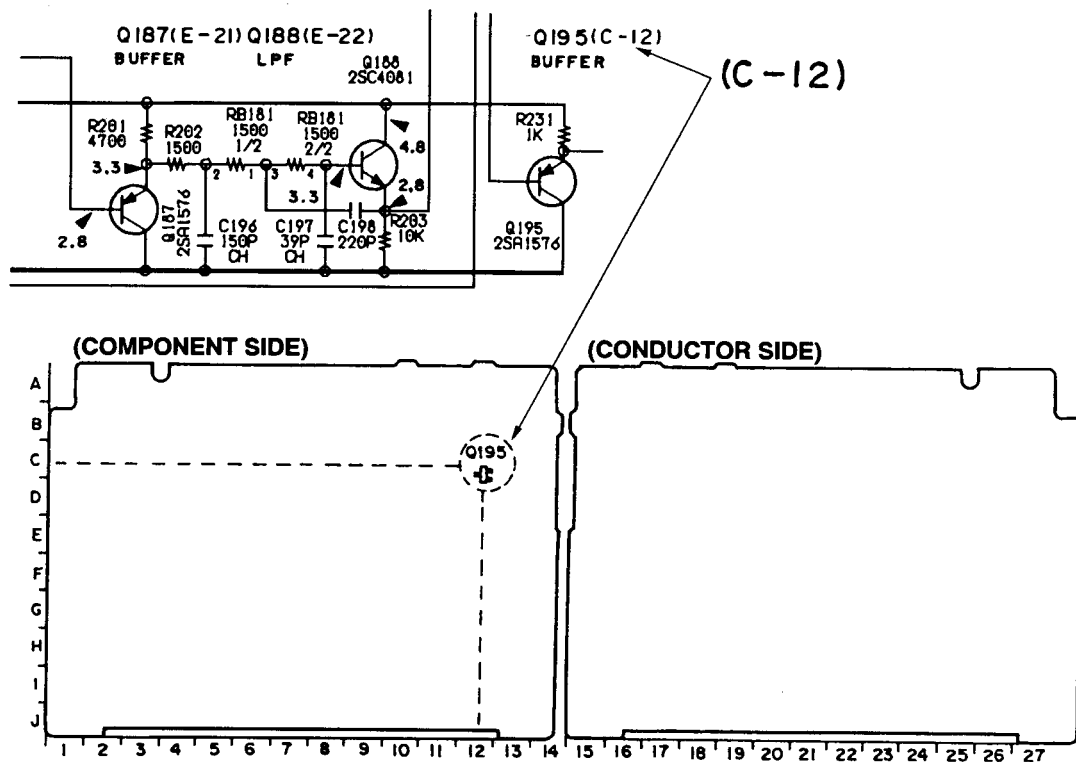
[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 87, 107, 141, 143.)

This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.



[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

- ① Use a blank tape, record a short section, then press the stop button to stop.
- ② Set to recording mode again.
- ③ If the [X] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

- ① Play back a pre-recorded tape and display the image on a TV screen.
- ② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

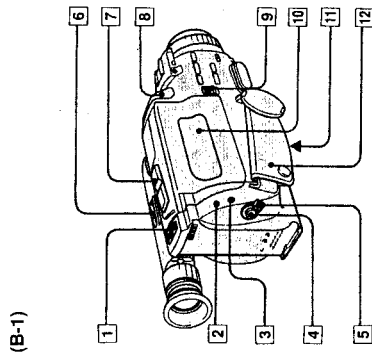
- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

SECTION 1 GENERAL

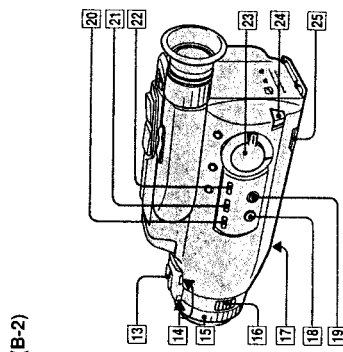
This section is extracted from instruction manual.

Identifying the Parts

For details on the use of each part, refer to the pages indicated in the parenthesis.



- (B-1)
- 1 POWER switch (15)
 - 2 REMOTE ⚡ (LANC)* control connector (stereo mini-jack) (26)
 - 3 Ⓜ (earphone) jack (mini-jack) (25)
 - 4 START/STOP button (20)
 - 5 STANDBY switch (15)
 - 6 EDITSEARCH (and Ⓜ recording review) button (24, 25)
 - 7 Power zoom (MACRO) button (23)
 - 8 Built-in microphone
 - 9 EJECT (cassette eject) knob (18)
 - 10 Cassette holder (18)
 - 11 Lithium battery holder (14)
 - 12 Grip strap (20)

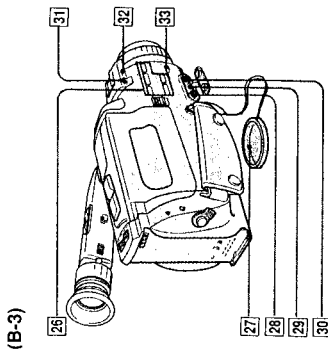


- (B-2)
- 13 Accessory shoe (26)
 - 14 Remote control sensor (7)
 - 15 Focus ring (28)
 - 16 FOCUS (AUTO/MANUAL/PUSH AUTO) switch (20, 28)
 - 17 Tripod receptacle (bottom)
 - 18 FADER button (31)
 - 19 BACK LIGHT button (29)
 - 20 DATE (+) button (15, 16, 22)
 - 21 TIME (NEXT) button (15, 16, 22)
 - 22 AGE/EVENT button (16, 22)
 - 23 PROGRAM AE selector (20, 30)
 - 24 BATT (battery eject) knob (9)
 - 25 Shoulder strap hook (5)

*About the ⚡ (LANC)
⚡ LANC stands for Local Application Control Bus System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

Identifying the Parts

- (B-3)
- 26 Tape transport buttons (36, 37)
▶ PLAY (playback)
▶▶ FF (fast-forward)
◀◀ REW (rewind)
◻ STOP (stop)
⏸ PAUSE (pause)
 - 27 Lens cap (20)
 - 28 VIDEO output jack (phono jack) (35)
 - 29 RFU DC OUT (RFU adaptor DC output) jack (special mini-jack) (26)
 - 30 AUDIO output jack (phono jack) (35)
 - 31 MIC jack (PLUG IN POWER) (mono mini-jack) (26)
 - 32 Remote control sensor (7)
 - 33 REC MODE (recording mode)/EDIT switch (20, 39)

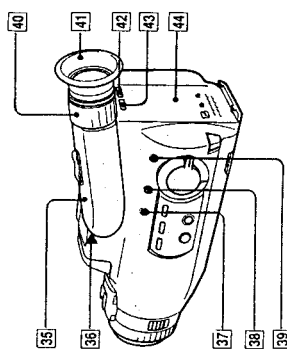


(B-4)

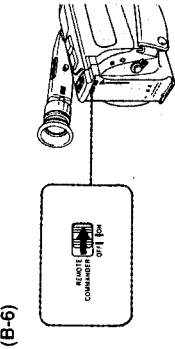
Mode	Recording	Playback	Editing
Setting			
Function	Recording mode switch	EDIT switch	EDIT switch

- (B-4)
- 34 Shoulder strap hook
- (B-5)

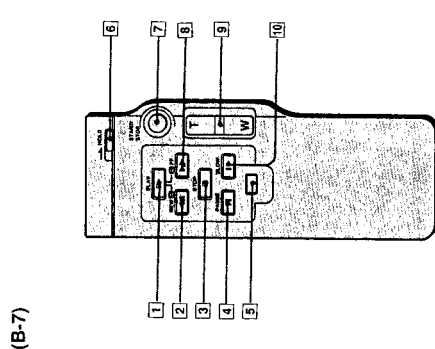
- (B-5)
- 35 Viewfinder
 - 36 Camera recording/battery lamp (9, 20, 47)
 - 37 COUNTER RESET button (25, 38)
 - 38 ZERO MEM button (25, 38)
 - 39 TAPE/BATT CHECK button (9, 26)
 - 40 Viewfinder adjustment ring (19)
 - 41 Eyecup (42)
 - 42 BEEP ON/OFF switch (8)
 - 43 Ⓜ REMOTE COMMANDER ON/OFF switch (6)
 - 44 Battery mounting surface



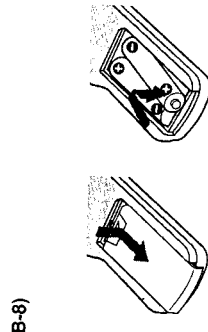
Identifying the Parts



(B-6)



(B-7)



(B-8)

Wireless Remote Commander

You can control camera recording and playing back from a distance. The buttons on the Remote Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander

Be sure to insert the supplied batteries into it and to set the REMOTE COMMANDER ON/OFF switch on the camcorder to "ON". (B-6)
For details, refer to the pages indicated in the parenthesis.

(B-7)

1 ▷ **PLAY (playback) button** (25, 36)

2 ◀◀ **REW (rewind) button** (25, 36)

3 ◻ **STOP button** (25, 36)

4 || **PAUSE button** (36)

5 DATA **SCREEN button*** (37)

6 **HOLD switch***

Slide it in the direction of the arrow when you want to prevent the buttons on the camcorder from being accidentally pressed.

7 **START/STOP button** (20)

8 FF ▶▶ **(fast forward) button** (35, 37)

9 **Power zoom button** (23)

10 ◀ **SLOW (slow playback) button*** (37)

Note

The * indicates the functions which are operable only with the Commander.

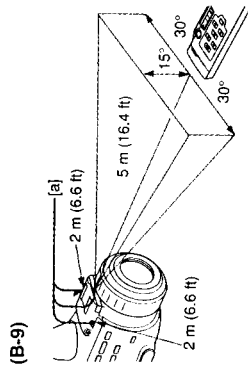
Inserting batteries (B-8)

Insert two size AA (R6) batteries with the + and - ends properly position.

Note on batteries

With normal operation, batteries will last for about six months. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.

Identifying the Parts



(B-9)

Remote controllable area (B-9)
Aim the Commander at the remote sensor [a] on the camcorder. The illustration shows the approximate maximum distance and angle for remote control.

Notes on the Remote Commander

- **Keep the remote sensor away from the strong light source such as direct sunlight or illumination. Remote control with the Commander may not be effective.**
- Be sure that there is no obstacle between the remote sensor and Commander.
- This camcorder works through the signals of commander mode VTR 2. A commander mode is used to distinguish this camcorder from other Sony VTR to avoid misoperation. If you use another Sony VTR at commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VTR with black paper.

Preparing your camcorder 1 Connecting the Power Sources

First, Choose the Power Source.

For details, see the operation manual of the accessory you want to use.

Place	Power source	Accessory to be used
Outdoors	Battery pack	NP-55H (supplied), NP-55, NP-66H, NP-77, NP-77H or NP-77HD
	Alkaline batteries	Battery case EBP-77
Indoors	House current	AC power adaptor AC-V60A (supplied), AC-V30, AC-V35 or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77, car battery charger DC-S10 or AC power adaptor AC-V55 and car battery cord DCC-16AE

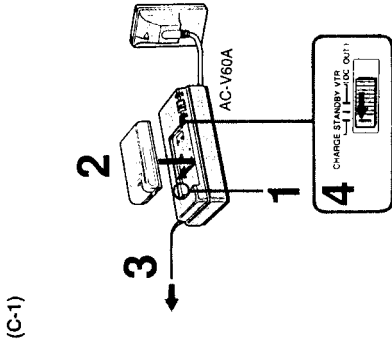
Connecting the Power Sources

Using the Battery Pack

Step 1

Charge the battery pack. (C-1)

- 1 Align the side of the battery pack with the side of the AC power adaptor.
- 2 Slide the battery pack in the direction of the arrow.
- 3 Connect the AC power adaptor to a wall outlet.
- 4 Set the CHARGE/VTR selector of the AC power adaptor to CHARGE.



(C-1)

* Approximate time in minutes using AC-V60A
 **Approximate time in minutes using fully charged battery pack, continuous recording indoors

When charging is finished, the charge indicator on the AC power adaptor will go out.

	NP-55H (supplied)	NP-77H NP-77HD	NP-77 NP-66H	NP-55 NP-55
Required charging time*	70	140	120	100
Battery life**	75	150	120	110
				60
				60

(C-2)

Using the BEEP switch

Before mounting the battery pack, check the BEEP switch preset to ON. It beeps when you start and stop recording, and if any difficulty should arise during operation. If you want to deactivate the beeps, set the BEEP switch to OFF before mounting the battery pack.

(C-2)

Notes

- Beeps are not recorded on the tape.
- For warning beeps, see page 47.

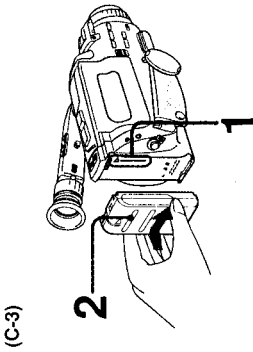
Connecting the Power Sources

Step 2

Mount the battery pack on the camcorder.

(C-3)

- 1 Align the right side of the battery pack with the white line on the camcorder.
- 2 Slide in the battery pack to the right. Make sure the battery is securely installed so that it does not fall.

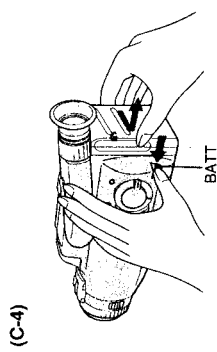


(C-3)

Removing the battery pack (C-4)
 Press the BATT knob in the direction of the arrow, and at the same time, slide out the battery pack to the left.

Battery life indicator

To check the remaining battery capacity, set the POWER switch to CAMERA, set the STANDBY switch up (see page 15) and press TAPE/BATT CHECK. The black bar of the battery life indicator [a] in the viewfinder shows remaining battery power (C-5). After the black bar disappears, the [a] indicator and a red lamp will flash in the viewfinder (C-6). The battery lamp on the camcorder will flash also.



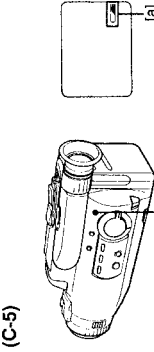
(C-4)

Note

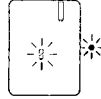
The battery life indicator of the camcorder may indicate a different remaining capacity from that on the NP-77HD battery pack.

How to use the switch on the battery pack (C-7)

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.



(C-5)



(C-6)



(C-7)

Other options for charging

- AC-S10 AC power adaptor: This adaptor has a discharging function. It charges the battery pack after ensuring optimum battery capacity by complete discharging.
- DC-S10 car battery charger: This charger has a discharging function. When you want charging only, slide the skip switch on the charger in the direction of the arrow.

Connecting the Power Sources

Using Alkaline Batteries

(C-8)

The battery case EBP-77 (not supplied) is required.

Note

You cannot use manganese batteries.

- 1 Insert 12 R6 (AA) size alkaline batteries into the battery case.
- 2 Attach the battery case in the same way as the battery pack.

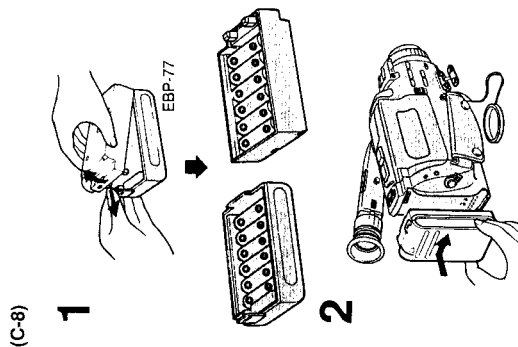
Battery life (when using Sony alkaline batteries)
The battery lasts for approximately 2 hours and 15 minutes under continuous recording indoors. However, when you use non-Sony alkaline batteries, their life may shorten.

Notes on battery life

- Batteries will not last as long in cold places.
- No indicator appears in the viewfinder when the batteries are weak.

To remove the battery case

Remove it in the same way you do the battery pack. See page 9.



Connecting the Power Sources

Using Household Current

(C-9)

Use the supplied AC power adaptor AC-V60A.

- 1 Align the right side of the connecting plate with the line on the camcorder, and slide it in the direction of the arrow.
- 2 Connect the AC power adaptor to a wall outlet.
- 3 Set the CHARGE/VTR selector of the AC power adaptor to VTR.

Removing the connecting plate

Remove it in the same way as you do with the battery pack. See page 9.

Using Car Battery

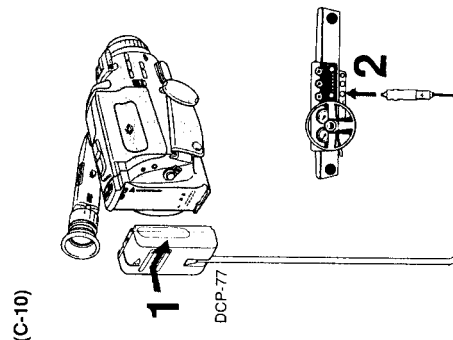
(C-10)

The DCP-77 DC pack is required (not supplied).

- 1 Align the right side of the DC pack with the line on the camcorder, and then push down and slide it in the direction of the arrow.
- 2 Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).

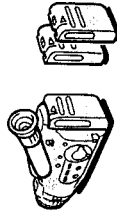
Removing the DC pack

Remove it in the same way as the battery pack. See page 9.



Using the Best out of the Battery Pack

(D-1)

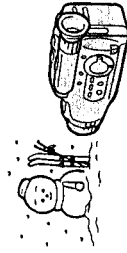


Have sufficient battery pack power to do 2 to 3 times as much recording than you have planned.

(D-1) "Battery life" as indicated in the operation manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a fully charged battery.

(D-2) Battery life is shorter in a cold climate. Battery efficiency is decreased and the battery will be used up more quickly.

(D-2)



Turn the **STANDBY** switch of the camcorder down when not recording to save battery power.

A smooth recording can be made even if recording is stopped and started again. **(D-3)** While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

(D-3)

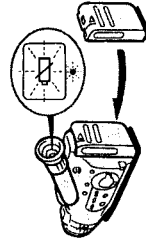


When the Rechargeable Battery Pack Should Be Replaced

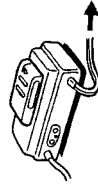
After the black bar disappears in the battery life indicator, the **CL** indicator and a red lamp will start flashing in the viewfinder. When they change from slow flashing to fast flashing, replace the battery pack. **(D-4)**

Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

(D-4)



(D-5)



Notes on Charging

Before using the battery pack, charge it sufficiently. A new battery pack is not charged.

Recharge the battery pack only when it is exhausted. (D-5)

- Make sure to use up the battery before charging.
- If recording is completed before the **CL** indicator appears in the viewfinder, it is recommended that you remove the cassette, set the **POWER** switch to **CAMERA**, turn the **STANDBY** switch up until it snaps, and leave the camcorder until the recording/battery lamp flashes rapidly. When using the **AC-S10** AC power adaptor or the **DC-S10** car battery charger, you can discharge the battery with their discharging function.
- Repeated charging while some capacity remains causes a lowering of battery capacity.

However, the original battery capacity can be recovered if you fully discharge and charge the battery again.

Recharge the battery pack just before using. If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

12

Using the Best out of the Battery Pack

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.



(D-6)

(D-6) When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and - terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

Why the battery pack heats up (D-7)

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not a cause for concern.



(D-7)

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the **POWER** switch is set to **OFF**. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery before using.

How many times can the battery pack be recharged

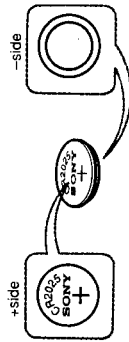
It can be fully charged and discharged about 500 times under normal temperatures. If the **CL** indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack is dead. The battery pack should be replaced with a new fully charged one.

Temperatures during charging

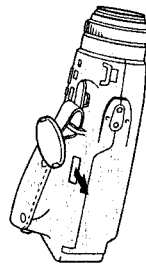
Charge under temperatures ranging from 10 to 30°C (50 to 85°F). Lower temperatures require a longer charging time.

13

(E-1)



1



2



Preparing your camcorder 2 Setting the Date and Time

Inserting the Lithium Battery (E-1)

To keep birth dates in the camcorder's memory as well as to activate the clock, a lithium battery (supplied) must be installed.
The lithium battery has a + (plus) side and a - (minus) side. Be sure to install the supplied lithium batteries with the + and - ends properly position.

- 1 Remove the lithium battery holder located at the bottom of the camcorder.
- 2 Install the supplied CR2025 lithium battery with the + side facing down.
- 3 Put the lithium battery holder into the camcorder.

Changing the lithium battery

Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Note on lithium battery life

The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the & indicator will flash in the viewfinder screen for about 5 seconds (when the POWER switch is set to CAMERA).

In this case, **replace the battery with a Sony CR2025.**

Use of any other battery may present a risk of fire or explosion.

While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time and birth dates are necessary.

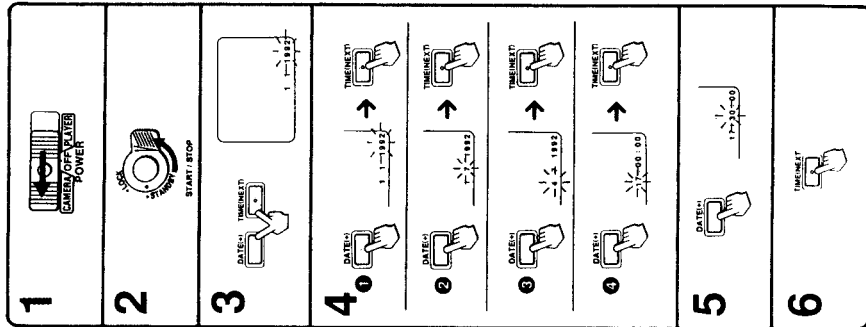
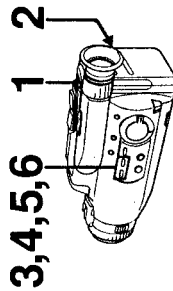
CAUTIONS

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

WARNING

The battery may explode if mistreated.
Do not recharge, disassemble or dispose of it in fire.

(E-2)



Setting the Date and Time

Setting the Date and Time (E-2)

Make sure that a power source and lithium battery are attached.

- 1 Press the small green button on the POWER switch and slide it to CAMERA.
- 2 Set the STANDBY switch up.
- 3 Press DATE (+) and TIME (NEXT) simultaneously for more than two seconds until the date indicator appears in the viewfinder.
DATE (+) now functions as + (to advance numbers) and TIME (NEXT) functions as NEXT (to execute).

4 Adjust the flashing digits of the year, month, day and hour using DATE (+), and press TIME (NEXT).

- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1992, and proceeds as follows:
1992 ----> 1999 -> 2000 ----> 2020

5 Adjust the flashing digits of minute using DATE (+).

6 Press TIME (NEXT) to set the second to "00".

The clock starts working.

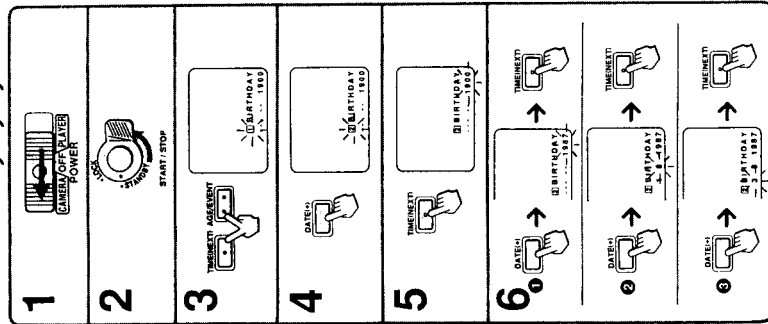
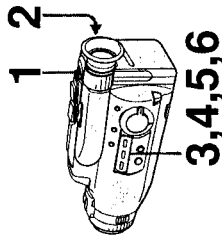
Correcting date and time setting
Repeat steps 3 to 6.

Checking the preset date and time
Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

If the camcorder goes off abruptly while setting the date and time

If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will turn off automatically. Set the STANDBY switch down once and set it up again.

(E-3)



Setting the Date and Time

Storing a Birth Date in Your Camcorder

(E-3)

When you preset your child's birth date in the camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update the age of your child. You can superimpose the age any time on your recording. You can preset up to three birth or event dates.

Before you begin

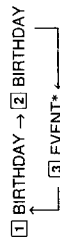
Before storing the birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

Storing birth date

Example: Store "Aug. 3 1987" in memory 2.

- 1 Set the **POWER** switch to **CAMERA**.
- 2 Set the **STANDBY** switch up.
- 3 Press **TIME (NEXT)** and **AGE/EVENT** simultaneously for a few seconds until the "BIRTHDAY" indicator appears in the viewfinder.
- 4 Press **DATE (+)** to select [2].

Each time you press **DATE (+)**, the indicator in the viewfinder changes as follows:

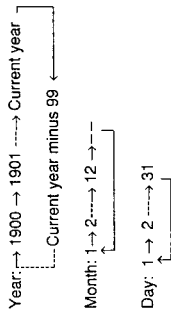


* Although "EVENT" is displayed on [3], you can use it for age as well. [1] and [2] can also be used for event.

- 5 Press **TIME (NEXT)**.
The "1900" indicator flashes.
- 6 Enter the birth date of your child.
First adjust the flashing digits with **DATE (+)**, and then press **TIME (NEXT)**. The age (year and month) appears when all items are adjusted.

Setting the Date and Time

If you missed the correct number with **DATE (+)** Keep pressing **DATE (+)**.
The indicator changes as follows:



Correcting and changing the setting
Follow the procedures from step 1 again.

Advancing the digits faster
Keep **DATE (+)** pressed.

Presetting the year before 1900

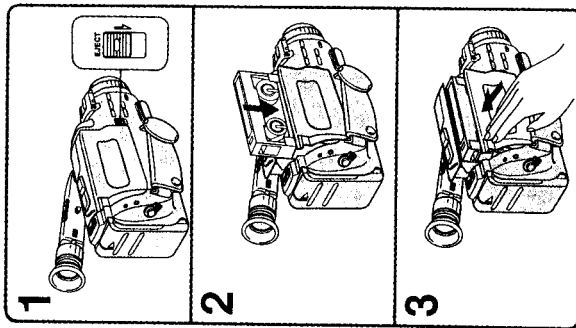
- 1 After step 5 on page 16, keep pressing **DATE (+)** until the current year is displayed.
- 2 Press **DATE (+)** again
The year goes back 99 years.
(example: 1992 -> 1893)
- 3 Go to step 6 in page 16.

When in 2000

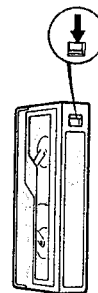
"----1901" is displayed in step 3 on page 16.
After that, it advances every year "1902, 1903, ...".

Preparing your camcorder 3 Inserting a Cassette

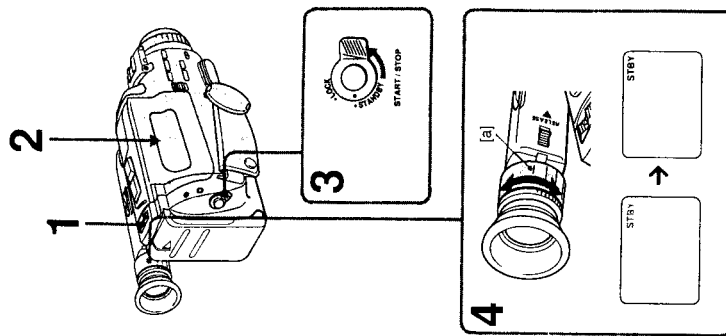
(F-1)



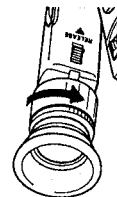
(F-2)



(G-1)



(G-2)



Preparing your camcorder 4 Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust it when using for the first time, or when using after someone else. (G-1)

Make sure a power source is connected.

- 1 While pressing the green button, set the POWER switch to CAMERA.
- 2 Insert a cassette (see page 18).
- 3 Set the STANDBY switch up until it snaps.
- 4 Turn the viewfinder lens adjustment ring [a] so that the "STBY" in the viewfinder screen comes into sharp focus.

Using the viewfinder as a sports finder

The sports finder allows you to monitor the picture while your eye is at a distance from the eyecup.

Setting the viewfinder to the sports finder position

Turn the viewfinder adjustment ring clockwise completely. (G-2)

Returning to the normal viewfinder position

Turn the adjustment ring counterclockwise until "STBY" in the viewfinder comes into sharp focus when a cassette is in your camcorder.

Inserting a Cassette

Make sure that a power source is connected.

- 1 While pressing the small blue button, push EJECT in the direction of the arrow. The cassette holder lifts up and opens.
- 2 Insert a cassette with the window facing outside.
- 3 Press the PUSH mark to close the cassette holder.

Ejecting the Cassette

Make sure that a power source is connected.

- 1 While pressing the small blue button, slide EJECT in the direction of the arrow.
- 2 Take out the cassette and press the PUSH mark to close the cassette holder.

Preventing Accidental Erasure

(F-2)

Slide the red tab to close the window to prevent accidental recording. To re-record on the tape, slide the tab opening the window.

If you try to record with the red mark exposed, the and indicators flash in the viewfinder and beeps sound for about 5 seconds.

Note on handling cassettes

Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if red mark is exposed or covered, etc.

Operating the Camera Section

Recording a Picture Using Automatic Adjustments

Before recording "once-only" events, we strongly recommend you make a trial record and check that everything is working perfectly.

To start Recording

(H-1)

- 1 Hold the camcorder by putting your hand through the grip strap so that your thumb can easily press the red START/STOP button.
- 2 Remove the lens cap and attach it to the grip strap.
- 3 While pressing the green button, set the POWER switch to CAMERA.
- 4 Set the REC MODE switch to LP (long play) or SP (standard play), according to the length that you plan recording.
- 5 Set the FOCUS switch to AUTO.
- 6 Set the PROGRAM AE switch to the green position.

- 7 Turn the STANDBY switch up. "STBY" appears in the viewfinder. Now you can see through the viewfinder.

- 8 Press START/STOP (red button). A beep sounds. "REC" appears and the red lamp lights up in the viewfinder and the camera recording/battery lamp lights on the camcorder. The camcorder is now recording.

When recording with the Remote Commander

Confirm that the REMOTE COMMANDER switch is set to ON, see page 6. Aim the Commander at the remote sensor on the camcorder. Then press START/STOP on the Commander to start recording. To standby (to stop recording momentarily), press it again. For preparation of the Commander, see pages 6 and 7.

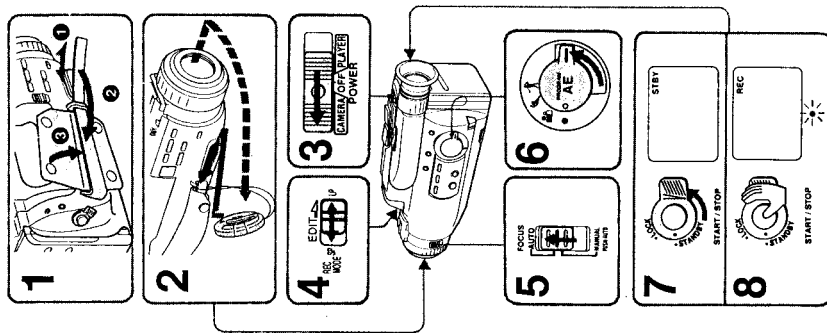
To standby (to stop momentarily)

Press START/STOP again. Two beeps sound and "STBY" appears in the viewfinder.

To stop

Turn the STANDBY switch down and set the POWER switch to OFF.

(H-1)



Recording a Picture Using Automatic Adjustments

For low-position recording (H-2)

Set the viewfinder to the sports finder position (page 19) and turn it for a recording in low position.
(The viewfinder barrel can be turned 180 degrees.) (H-3)

Near the end of the tape

The indicator in the viewfinder and the camera recording/battery lamp on the camcorder flash slowly. When the tape reaches its end, flashing becomes rapid and beeps sound for about 5 seconds (if the BEEP switch is set to ON).

Notes on recording

- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, set the STANDBY switch up until it snaps and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode

If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, set the STANDBY switch down once and slide it up again.

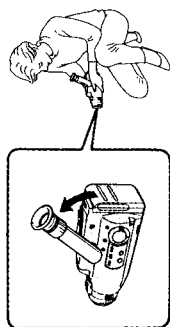
Note on light sources

If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

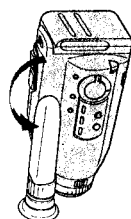
Recording mode

An 8 mm video format cassette records in the SP (standard play) mode and in the LP (long play) mode and can play back in the SP mode and LP mode. The quality of the recording picture in the LP mode, however, will not be as good as that in the SP mode.

(H-2)

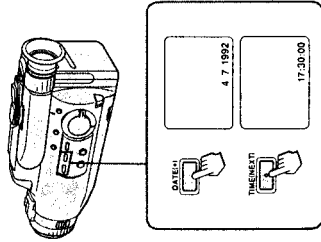


(H-3)

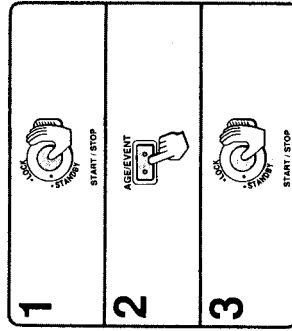
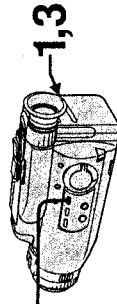


Recording a Picture Using Automatic Adjustments

(H-4)



(H-5)



Recording the Date or Time

(H-4)

During camera recording or when in standby mode, press **DATE (+)** for the date indicator or **TIME (NEXT)** for the time indicator. The date or time indicator displayed in the viewfinder is recorded with the picture.

To stop recording date or time

Press **DATE (+)** or **TIME (NEXT)** again. The picture recording continues.

Putting an Age on Your Tape

Here is how to put the ages of your children on your tape while recording. (H-5)

1 During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.
This puts the camcorder in standby mode.

2 Press AGE/EVENT to select the indicator you want to record.
Each time you press AGE/EVENT, the indicator changes as follows:

No indicator → **1** The first age

2 The second age

3 The third age ← **2** The second age

An item with no presetting is skipped. The **1**, **2**, or **3** indicator goes out after one second.

3 Press START/STOP.

Recording starts again. The age indicator in the viewfinder is recorded with the picture.

To stop recording the age

Press AGE/EVENT until the indicator goes out.

Changing the display while recording

Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you selected starts when **1**, **2** or **3** goes out.

Canceling the stored birth date

1 Perform step 1 to 4 in "Storing a Birth Date in Your Camcorder" on page 16, to select the memory number to be canceled.

2 Press TIME (NEXT) twice. The month indicator flashes.

3 Press DATE (+) until "--" appears.

4 Press TIME (NEXT).

The birth memory is deleted from the memory and is not displayed when you press AGE/EVENT.

Note

You cannot add the age later during playing back or editing.

22

Recording a Picture Using Automatic Adjustments

Using Zooming Features

By zooming, you can change the size of the subject in the scene. Use "zoom-in (Telephoto)" for dramatic close-ups, and "zoom-out (Wide-angle)" for panoramic long shooting. Also use the zoom to focus manually or to decide the shooting angle. A common mistake is using zoom-in or zoom-out too often. Use the zoom sparingly for zooming. (H-6)

Two-levels Speed Zooming (H-7)

The camcorder's power zoom button offers two-level speed zooming.

Press the button firmly for high speed zooming and softly for relatively slow zooming.

W side: for wide-angle (subject appears farther away)

T side: for telephoto (subject appears closer)

Two-level speed zooming cannot be operated with the power zoom button on the Commander.

Autofocusing in macro (H-8)

You can shoot subjects that are at least 1 cm (about 1/2 inch) away from the lens surface. When doing close-up, the depth of field (range the subject will be in sharp focus) is very shallow. So pay attention to focusing. To keep the subject in focus, use a tripod.

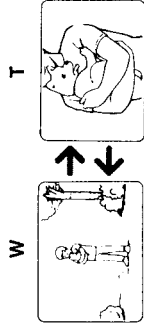
1 Set the FOCUS switch to AUTO.

2 Press the W side of the power zoom button until the indicator in the viewfinder stops at the W end.

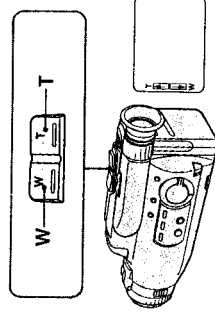
Manual focusing in macro

You can shoot with manual focus in doing close-up. For details, see page 28.

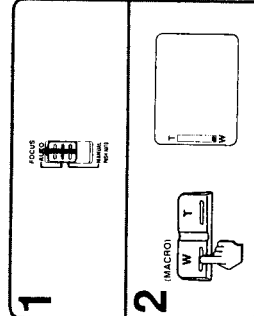
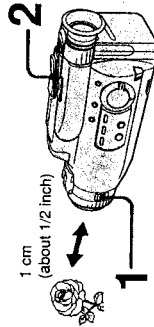
(H-6)



(H-7)



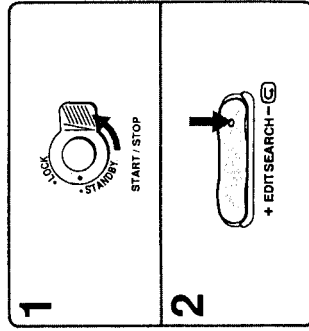
(H-8)



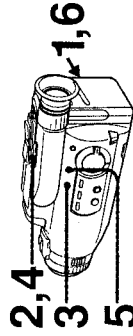
23

Recording a Picture Using Automatic Adjustments

(H-9)



(H-11)



Review
You can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks. (H-9)

1 Set the camcorder into standby mode by setting the **STANDBY** switch up.

2 Press the **+** side of **EDITSEARCH** (⊕).
The last few seconds of the recording portion are played back in the viewfinder. Then, the camcorder goes back to standby mode, ready for the next recording.

Checking your recorded picture – Editsearch
You can check the recorded picture in the viewfinder. After checking, you can also re-record over a previously recorded portion. (H-10)

1 Set the camcorder in standby mode by turning the **STANDBY** switch up.

2 Keep pressing the **+** side or **–** side of **EDITSEARCH** (⊕) to play back the picture while looking in the viewfinder.
+ side: to view the forward playback picture
– side: to view the reverse playback picture
To stop playback, release **EDITSEARCH**.

3 If you want to re-record over a recorded portion, follow the procedures below:

- Press the **+** or **–** side of **EDITSEARCH** to locate the point you want to begin the re-recording.
- Press **START/STOP** to start re-recording. Re-recording begins from the point you released **EDITSEARCH**. As long as the tape is not ejected, the transition between the scenes will be smooth.

24

Recording a Picture Using Automatic Adjustments

Monitoring the sound while viewing the playback picture in the viewfinder by using an earphone (not supplied)

- Connect an earphone to the **Ⓐ** jack.
- While pressing the green button, set the **POWER** switch to **PLAYER**.
- Press **◀▶** to rewind the tape and press **□** where you want to stop.
- Press **▶** to start playback.

Re-recording a Picture in the Middle of a Recorded Tape (Insert Recording)

(H-11)

1 Set the **STANDBY** switch up to set the camcorder into standby mode.

2 While looking in the viewfinder, keep pressing the **+** or **–** side of **EDITSEARCH** and release the button where you want to end the insertion.

3 Press **COUNTER RESET**.
The counter is reset to zero.

4 While looking in the viewfinder, keep pressing the **–** side of **EDITSEARCH** and release the button at the point where you want to start the insertion.

5 Press **ZERO MEM**.
The insert ending point is stored in memory.

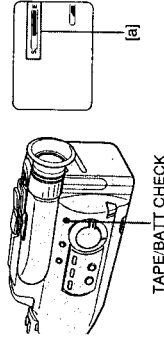
6 Press **START/STOP**.
A beep sounds (if the **BEEP** switch is set to **ON**) and insert recording begins. The insert recording stops automatically near the counter zero point.

Canceling the ZERO MEM
Press **ZERO MEM**.

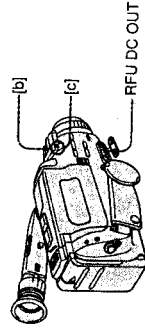
Note
The picture may be distorted at the end of the inserted portion when played back.

25

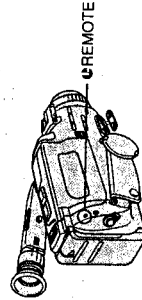
(H-12)



(H-13)



(H-14)



Recording a Picture Using Automatic Adjustments

Checking the time remaining of the tape (H-12)

Press TAPE/BATT CHECK.

After pressing TAPE/BATT CHECK, the tape length indicator [a] may not appear for about 20 seconds. When the time remaining is less than about 5 minutes, the indicator shows the minutes remaining.



When "5 min" appears, the indicator flashes in the viewfinder.

Notes on the tape length indicator

- The camcorder must be in the recording or playback mode when TAPE/BATT CHECK is pressed to find out the time remaining. In the playback mode, however, the indicator does not show the minutes remaining.
- The tape length indicator does not change while using EDITSEARCH.

Recording with an External Microphone (H-13)

You can connect an external microphone (not supplied) to the MIC jack [C]. This jack also accepts a "plug-in power" microphone. If the microphone has two plugs, connect the DC IN plug to the RFU DC OUT jack on the camcorder.

Attach the microphone to the accessory shoe [b] of the camcorder.

Note

When using an external microphone, wind noise is not muted.

Connecting a Wired Remote Control Unit (H-14)

When you connect a wired remote control unit or editing controller (not supplied) to the REMOTE connector, you can operate your camcorder from a distance.

Making Manual Adjustments

The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for effective recording. You can manually adjust focus and back light compensation with this camcorder. The settings not changed to manual mode remain in the automatic mode.

As long as you do not remove the battery, even if you set the POWER switch to OFF, the previous manual settings are retained.

Manual Focusing

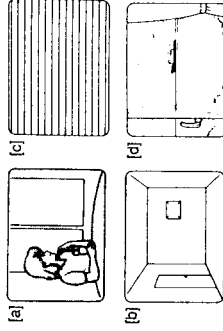
When using manual focus

You should also focus manually in the following situations (I-1):

- [a] Too bright behind the subject
- [b] Subjects with little contrast-wall, sky, etc.
- [c] Horizontal stripes
- [d] Subject through frosted glass

- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder.
- Bright subject or subject reflecting light
- High contrast behind the subject (The background may be in focus.)
- When shooting a stationary subject using a tripod
- When you want to save battery power

(I-1)



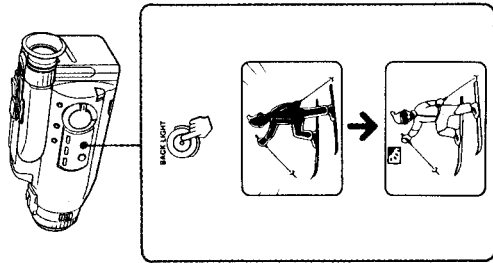
Compensating Backlighting

In this camcorder, the iris is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. (J)

Press BACK LIGHT.
The indicator appears. If it does not appear, press the button again.

After shooting, be sure to release this adjustment condition by pressing BACK LIGHT again. (The indicator goes out.)
Otherwise, the recorded picture will become too bright.

(J)



Manual Focusing

Focusing Manually

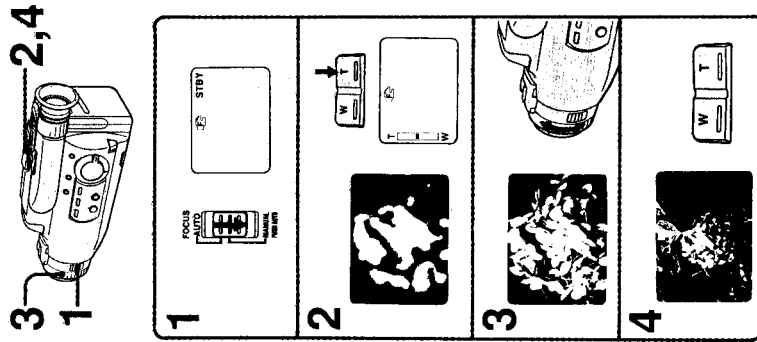
(I-2)

- 1 Set the FOCUS switch to MANUAL.
The indicator appears in the viewfinder.
- 2 Keep pressing T side (telephoto) of the power zoom button until the zooming stops.
The power zoom indicator appears in the viewfinder.
- 3 Turn the focus ring to achieve sharp focus.
The focusing ring does not have a stop position.
- 4 Set the desired shot length using the power zoom button.

Shooting with autofocus momentarily
While shooting with manual focusing, push the FOCUS switch down to PUSH AUTO. The autofocus functions while you are pressing the button. When you release the switch, manual focusing will be resumed. Use this function when you change the focus from one subject to another. The focusing performs naturally.
The previous settings except for focusing are retained.

Shooting in relatively dark places
Shoot at wide angles after focusing in telephoto.

(I-2)



Using Program AE

When you see the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (shallow depth of field) or capture high-speed action with "sports" mode or "high-speed shutter" mode.

What is PROGRAM AE (Auto Exposure)?

Program AE automatically selects just the right combination of shutter and aperture settings and gives you creative control for depth of field (distance range of objects that will be in sharp focus.) There are four preprogrammed modes: Normal (the green position), Portrait , Sports , and High-speed shutter .

(K) Selecting AE mode

Set the PROGRAM AE selector to the desired mode. The selected mode is indicated in the viewfinder.

To resume the automatic mode

Set PROGRAM AE to the green position. [a]

Use the appropriate mode when shooting the following subjects or when shooting under the following conditions.

Portrait Mode [b]

- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- when there is something between the camcorder and the subject, such as a chain link fence

Sports Mode [c]

- outdoor sports scene such as football or tennis.
- recording a landscape in the running car
- subjects moving at high speed, such as a roller coaster on a cloudy day

High-speed Shutter Mode [d]

- shooting a golf swing or a tennis match with the tennis ball captured clearly.
- you wish to play back certain scenes with high-speed movement in a clear, sharp picture.

Note

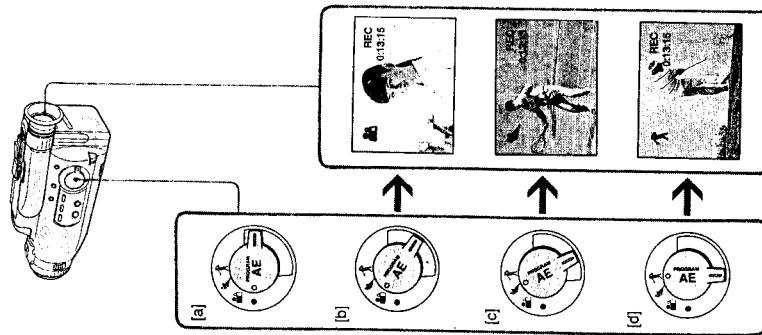
The shutter speed in each PROGRAM AE mode is as follows:

Portrait mode — between 1/50 to 1/2000

Sports mode — between 1/50 to 1/500

High-speed shutter mode — 1/4000

(K)



Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional appearance.

When fading-in [a], the picture will gradually appear from black. The sound will also gradually increase.

When fading-out [b], the picture will gradually fade to black. The sound will decrease. (L-1)

(L-2)

Fading-in

1 Press FADER after setting the STANDBY switch up to put the camcorder into standby mode.
The fader indicator starts flashing.

2 Press START/STOP.

The fade indicator stops flashing and the recording starts fading in.

Fading-out

1 Press FADER while recording.

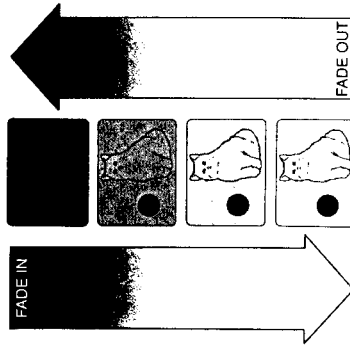
The fade indicator starts flashing.

2 Press START/STOP.

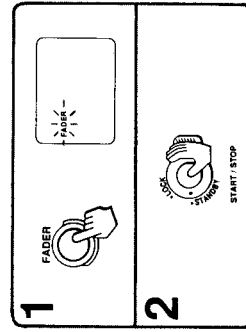
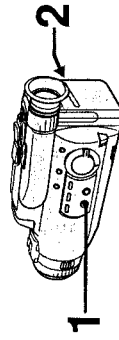
The fade indicator stops flashing and the picture fades out and then the recording stops.

To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER again.

(L-1)



(L-2)



Operating the Player section

Connections for Playback

You must connect the camcorder to the TV and/or VTR properly to view the playback picture. Check if your TV has audio/video input jacks. For details on the TV and VTR, refer to their operation manuals.

Connecting a TV without Audio/Video input jacks

For the customers supplied with the RFU-90E

(M-1)

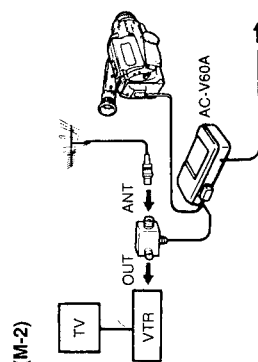
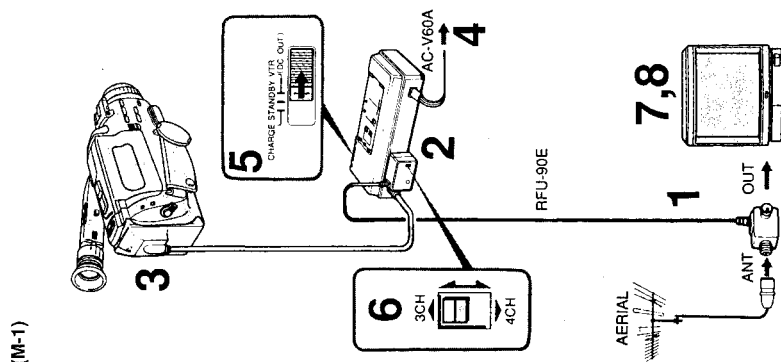
- 1 Connect the aerial and TV to the RFU adaptor.
- 2 Connect the RFU adaptor to the AC power adaptor.
- 3 Attach the connecting plate of the AC power adaptor to the camcorder.
- 4 Connect the AC power adaptor to a wall outlet.
- 5 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
- 6 Select the RF unit selector of the RFU adaptor to 3CH or 4CH whichever is not used in your area.
- 7 Turn on the TV and select the 0 position.
- 8 Tune the TV so that you can get picture and sound from the camcorder.

Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

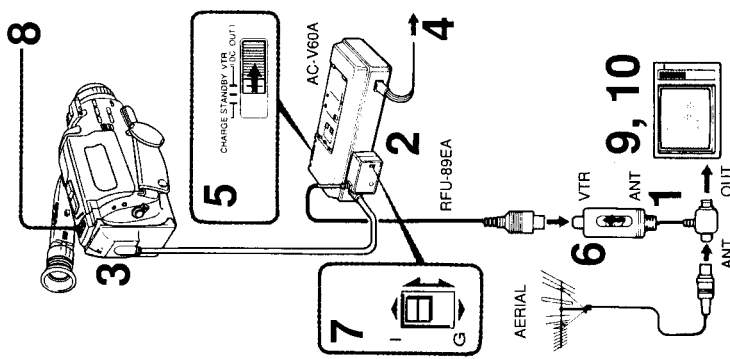
When you watch a TV programme
Set the CHARGE/VTR switch on the AC power adaptor to STANDBY or turn off the power of the camcorder.

Without an AC power adaptor
You can also connect the RFU adaptor directly to the camcorder without an AC power adaptor, using the AUDIO/VIDEO (and RFU DC OUT) jacks. In this case, keep the battery pack or other Battery sources attached.

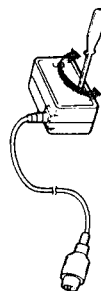
If your TV is connected with a VTR (M-2)
Connect the camcorder to the VTR instead of the TV.



(M-3)



(M-4)



Connections for Playback

For the customers supplied with the RFU-89EA

(M-3)

- 1 Connect the aerial and TV to the RFU adaptor.
- 2 Connect the RFU adaptor to the AC power adaptor.
- 3 Attach the connecting plate of the AC power adaptor to the camcorder.
- 4 Connect the AC power adaptor to a wall outlet.
- 5 Set the CHARGE/VTR switch of the AC power adaptor to VTR.
- 6 Set the selector switch of the aerial selector to VTR.
- 7 Set the I/G selector of the RFU adaptor according to the TV system of your country.
- 8 Set the POWER switch of the camcorder to CAMERA, insert a cassette and set the STANDBY switch up.
- 9 Turn on the TV and select a programme position that is not used to receive a TV station.
- 10 Tune the TV so that you can get picture and sound from the camcorder.

When the picture from the camcorder is not free of disturbance (M-4)

- 1 Set the ANT/VTR selector on the aerial selector to ANT.
- 2 Select a programme position between UHF channels 30 and 39 so that the TV shows no picture and a steady rustling sound or no sound is heard.
- 3 Set the ANT/VTR selector on the aerial selector to VTR.
- 4 Turn the screw on the RFU adaptor slowly with the supplied screwdriver so that the picture from the camcorder is clearly displayed on the TV screen.

Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

When you watch a TV programme
Set the selector switch of the aerial selector to ANT.

Connections for Playback

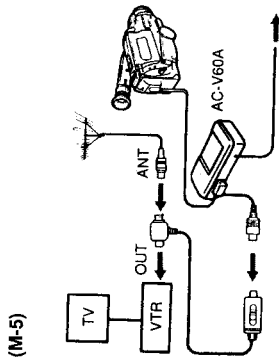
Without an AC power adaptor

You can also connect the RFU adaptor directly to the camcorder without the AC power adaptor, using the AUDIO/VIDEO (and RFU DC OUT) jacks.

In this case, keep the battery pack or other power source attached.

If your TV is connected with a VTR (M-5)

Connect the camcorder to the VTR instead of the TV.



(M-5)

Connecting to a TV with Audio/Video Input Jacks

(M-6)

Leave the TV aerial cable connected to the TV.

1 Connect the AC power adaptor to the TV.

Use an appropriate AV connecting cable according to the connector type of your TV. Sony offers you the following cables (not supplied).

VMC-710M/720M: for monaural TV

VMC-910MS/920MS: for stereo TV

When your TV has a 21-pin connector (EUROCONNECTOR)*, use a 21-pin adaptor VMC-91 (not supplied).

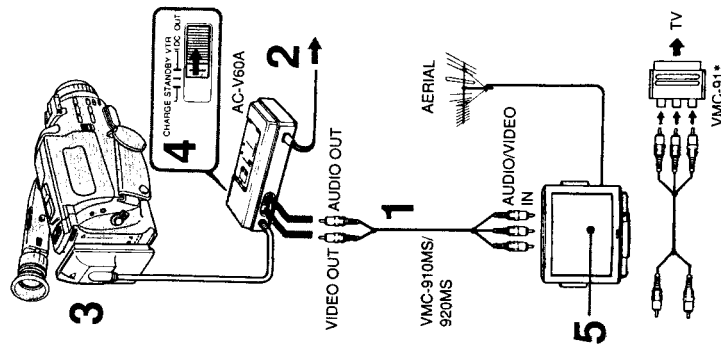
2 Connect the AC power adaptor to a wall outlet.

3 Attach the connecting plate of the AC power adaptor to the camcorder.

4 Set the CHARGE/VTR switch of the AC power adaptor to VTR.

5 Turn on the TV and set the TV/VIDEO selector on the TV to VIDEO.

(M-6)



Connections for Playback

Connecting to a TV without an AC power adaptor (M-7)

Leave the TV aerial cable connected to the TV.

1 Connect the A/V connecting cable (not supplied) directly to the camcorder using the AUDIO/VIDEO jacks.

2 Connect the other end of the A/V connecting cable to the TV.

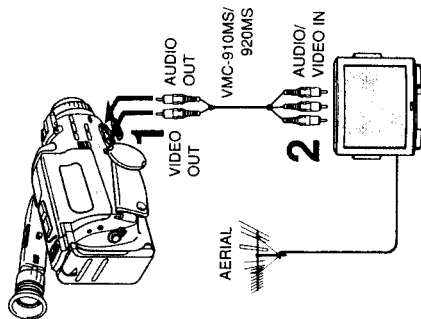
Connecting to a TV via a VTR (M-8)

Leave the VTR aerial cable connected to the VTR.

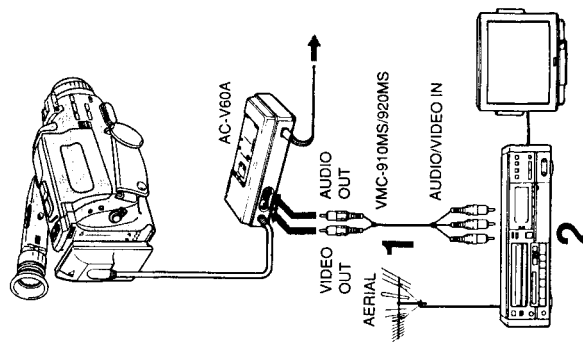
1 Connect the camcorder to the VTR using the A/V connecting cable.

2 Set the input selector on the VTR to LINE and set the TV/VIDEO selector on the TV to VIDEO.

(M-7)

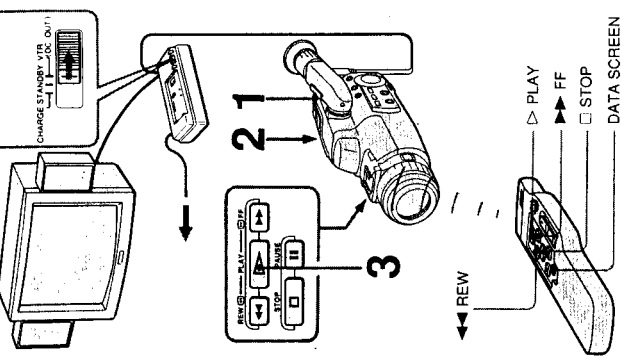


(M-8)



Playing Back a Tape

Turn on the TV, and select the channel for viewing a playback picture (set the TV/VIDEO selector to VIDEO). Of course, you can monitor the playback picture in the viewfinder at the same time.



(N-1)

1 Set the POWER switch to PLAYER while pressing the green button.

2 Insert a cassette.

3 Press $\blacktriangleright$.
Playback starts.

To view the still picture (playback pause), press **II** PAUSE during playback.

II appears in the viewfinder.

To resume normal playback, press $\blacktriangleright$ or **II**.

Note

When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

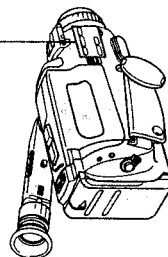
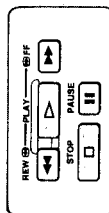
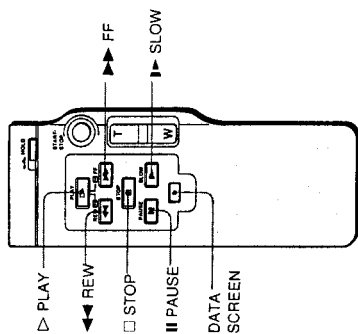
To rewind the tape, press $\blacktriangleleft$.

To advance the tape rapidly, press $\blacktriangleright\blacktriangleright$.

To stop playback, press $\square$.

To stop the tape momentarily, press **II**.

(N-2)



Playing Back a Tape

Monitoring a High-Speed Picture (N-2)

To locate the desired scene (picture search) Keep pressing $\blacktriangleleft$ or $\blacktriangleright$ during playback or in the still picture mode. FF or FF appears in the viewfinder.

To resume normal playback, release the button.

To locate the desired scene quickly (skip scan) Press $\blacktriangleleft$ while rewinding or $\blacktriangleright$ while advancing the tape rapidly. FF or FF appears in the viewfinder.

To resume normal playback, press $\blacktriangleright$.

Monitoring a Slow-Speed Picture

To view the picture at 1/5 speed (slow playback, only on the Commander), press $\blacktriangleright$ during playback.

S appears in the viewfinder.

To resume normal playback, press $\blacktriangleright$.

Note

When slow playback lasts for 1 minute or more, playback at the normal speed starts automatically.

Displaying the Viewfinder Screen Indicators on the TV

Press **DATA SCREEN** on the Commander.

The indicators on the viewfinder screen appear on the TV.

To erase the indicators, press **DATA SCREEN** again.

Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

Counting the Whole Tape

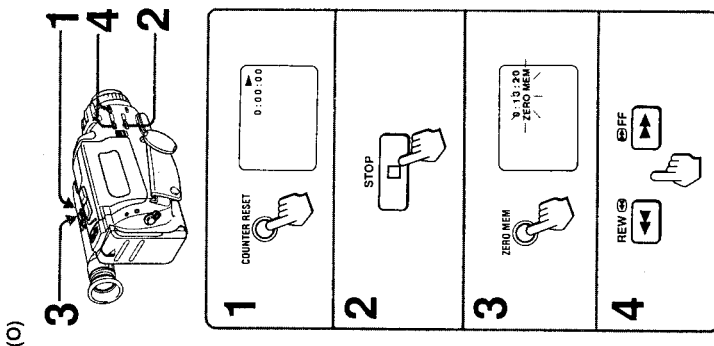
Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00".

To Return to a Pre-registered Point

- During playback, press COUNTER RESET at the point you later want to locate.**
The counter shows "0:00:00".
 - Press ☐ when the playback has finished, as usual.
 - Press ZERO MEM.
The "ZERO MEM" indicator flashes in the viewfinder.
- Note**
Be sure to press ZERO MEM after you stop the tape. It does not function during playback.
- Press **◀◀** or **▶▶**.
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button

- Something must be recorded on the tape in order for the tape counter to function. Tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.



Editing onto Another VTR

You can create your own video program by editing with any other **8** 8-mm, **18** Betamax or **VHS** VHS format VTR.

Before You Begin

(P)

- Make connections using an appropriate A/V connecting cable according to the connector type of your VTR.
Sony offers you the following cables (not supplied).
[a] VMC-710M/720M: for monaural type VTR
[b] VMC-910MS/920MS: for stereo VTR
- Set the input selector of the VTR to LINE, if available.

Operation

- Insert a cassette to be recorded on into the recording VTR.
- Set the EDIT switch on the camcorder to the direction of the arrow (EDIT ON).
- Set the CHARGE/VTR switch on the AC power adaptor to VTR.
- Set the POWER switch of the camcorder to PLAYER and insert your recorded cassette.
- Play back on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
- On the recording VTR, locate the recording starting point and set the VTR to the recording pause mode.
- Press **II** of the VTR and camcorder simultaneously to start editing.

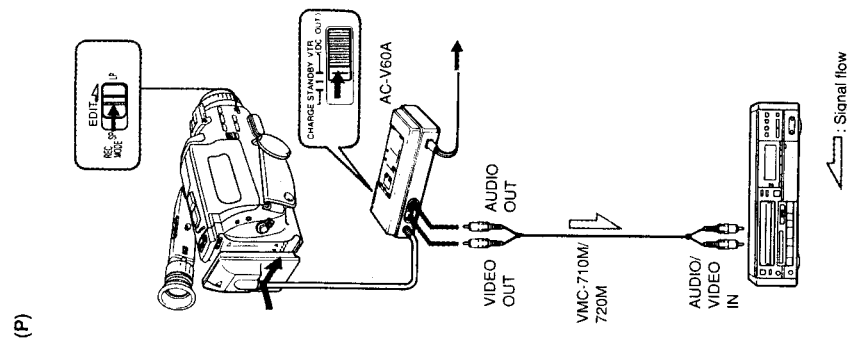
To stop editing momentarily, press **II on the recording VTR.**

To edit more scenes, repeat steps 5 to 7.

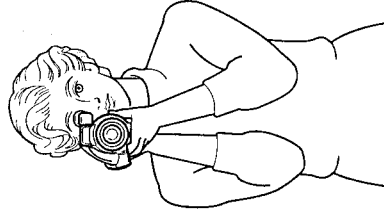
To stop editing, press ☐ on the VTR and camcorder.

Use of the EDIT switch

When you set the EDIT switch to the direction of the arrow (EDIT ON), picture deterioration resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).



(Q)



For Your Information

Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting (Q)

For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod

If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Note

When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm. Otherwise, the screw may damage the inner parts of the camcorder.

Keep the horizontal plane level

The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Lighting

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

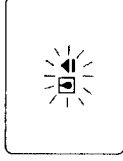
- The subject is indoors and there is a window behind the subject.

- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

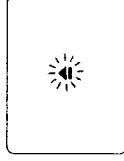
Use video light (not supplied) in the dark

To get the best colours, you must maintain a very high lighting level. When using a video light, attach it to this camcorder with a video light attachment (not supplied).

(R-1)



(R-2)



Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

- 1 Be sure to tightly seal the plastic bag containing the camcorder.
- 2 Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

If moisture condenses inside the unit (R-1)

Moisture is present inside the camcorder when:

- the  indicator in the viewfinder flashes. When the cassette is inserted, the  indicator also flashes.
- beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for cassette ejection will work.

Eject the cassette, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.

The camcorder can be used again if the  indicator does not appear when the power is turned on again.

If moisture condenses on the surface of the tape (R-2)

Moisture is present on the surface of the tape when:

- The  indicator flashes in the viewfinder when the cassette is inserted and a tape transport button (,  etc.) is pressed.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for cassette ejection will work.

Eject the cassette and let it sit for at least 1 hour.

The cassette can be used again if the  indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condenses on the lens

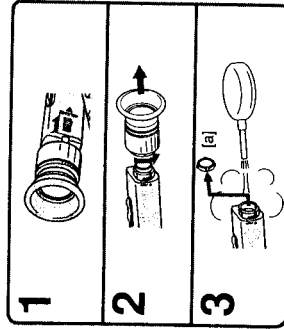
No caution indicators will appear, but the picture becomes dim.

Turn off the power and leave the camcorder unused for at least 1 hour.

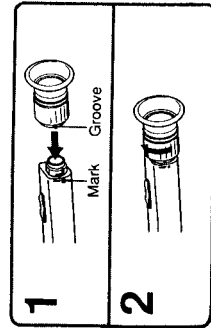
(R-3)



(R-4)



(R-5)



Notes and Precautions

Notes on Video Head Cleaning (R-3)

To ensure clear picture, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated.

- [a] Slight contamination
- [b] Critical contamination

In such cases,

- 1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
- 2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
- 3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Viewfinder Cleaning (R-4)

- 1 Pull the switch on the viewfinder barrel down.
- 2 Turn the eyecup in the direction of the arrow and detach the eyecup.
- 3 Clean the surface of the screen with a commercially available blower.
The small lens in the viewfinder can be removed. [a]

To reattach the eyecup (R-5)

- 1 Align the groove on the eyecup with the ● mark on the barrel.
- 2 Turn the eyecup in the reverse direction of the arrow.

Notes and Precautions

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- Do not let sand get into the camcorder.
When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.
- Do not let the camcorder get wet.
Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On care

- When the unit will not be used for a long time, periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Using your Camcorder Abroad

Each country has its own electricity system and TV colour system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Differences in colour systems

This camcorder is a PAL system based camcorder. If you want to view the playback picture on a TV, it must be a PAL system based TV or a SECAM system based TV with PAL-SECAM transcoder. Check the following alphabetical list.

PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Germany (Former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country

Brazil

PAL N system countries

Argentina, Paraguay, Uruguay

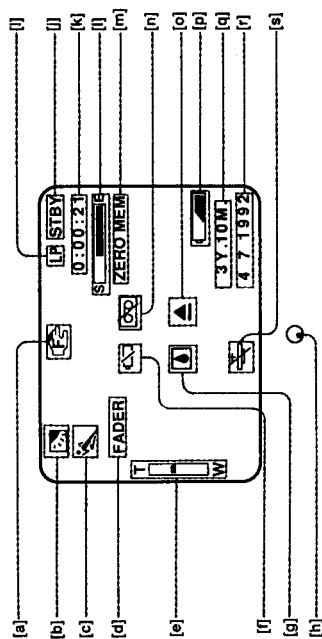
NTSC system countries

Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., etc.

SECAM system countries

Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

Indicators in the Viewfinder

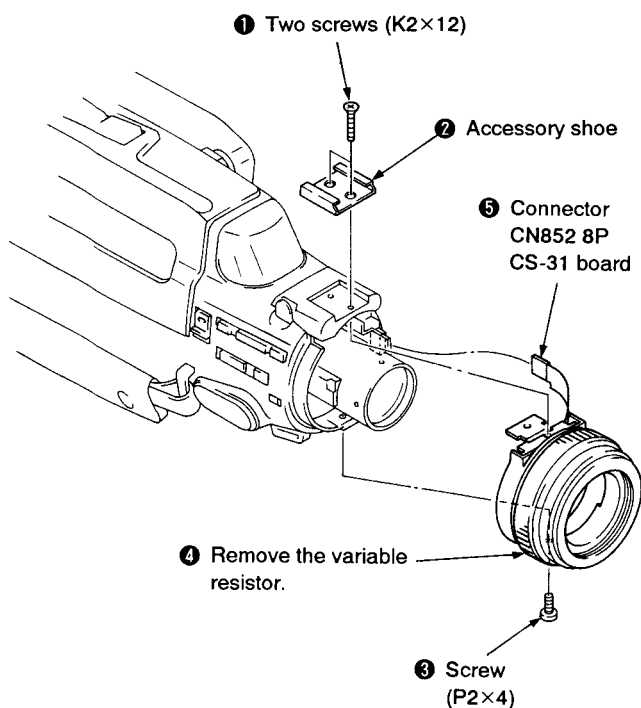


- [a] Manual focusing (MF)
- [b] BACK LIGHT is pressed (BL)
- [c] PROGRAM AE setting (P, A, S, T)
- [d] FADER is pressed
- [e] Power zoom indicator
- [f] "Exchange battery" (BATT)
- [g] Moisture has condensed (W)
- [h] Lights up during recording

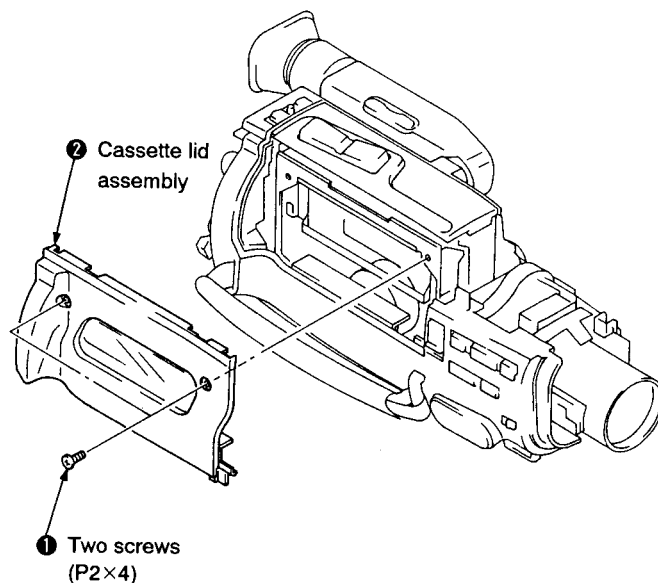
- [i] Recording or playback mode (LP, SP)
- [j] Tape transport mode
- [k] Tape counter
- [l] Remaining time of tape
- [m] ZERO MEM is pressed
- [n] "Exchange cassette or no cassette inside" (CAS)
- [o] "Trouble has occurred" (CLEAN video heads) (CLEAN)
- [p] Remaining capacity of a battery
- [q] Age
- [r] Date or Time
- [s] "Replace lithium battery" (REPL)

SECTION 2 DISASSEMBLY

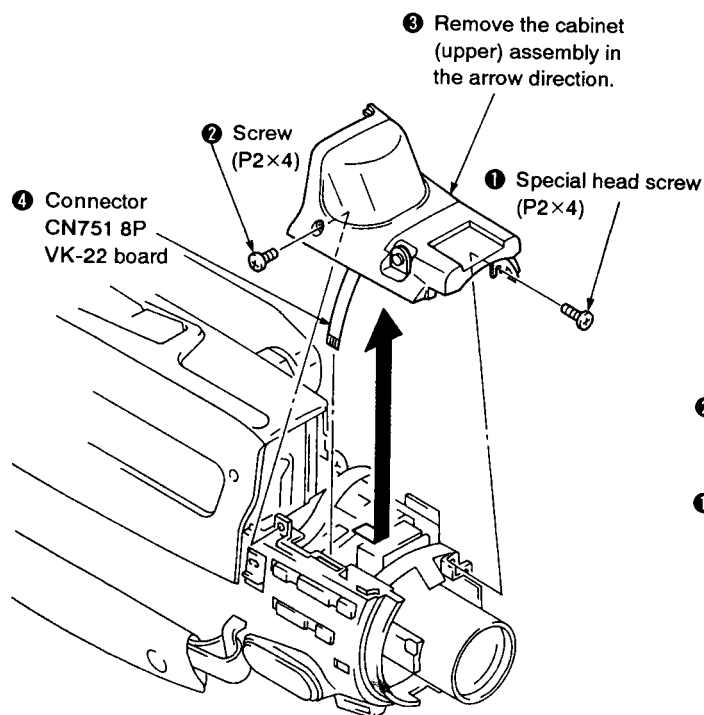
2-1. REMOVAL OF VARIABLE RESISTOR



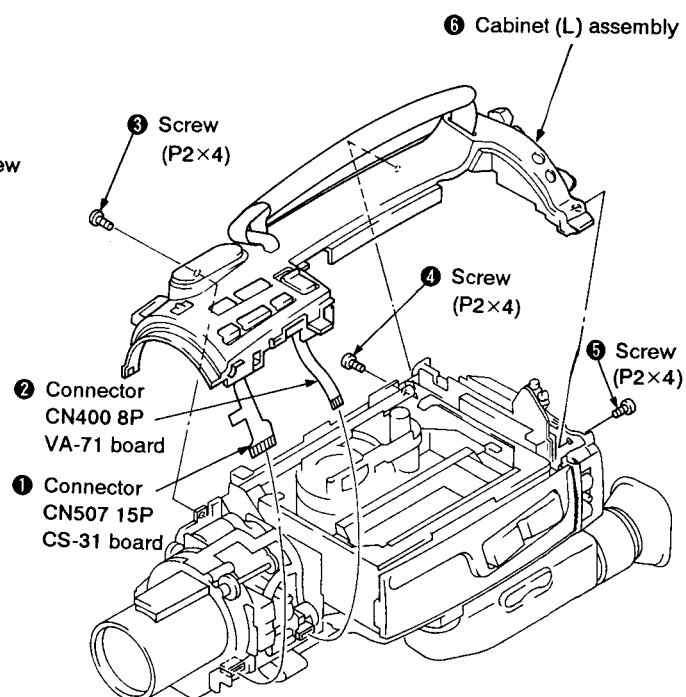
2-3. REMOVAL OF CASSETTE LID ASSEMBLY



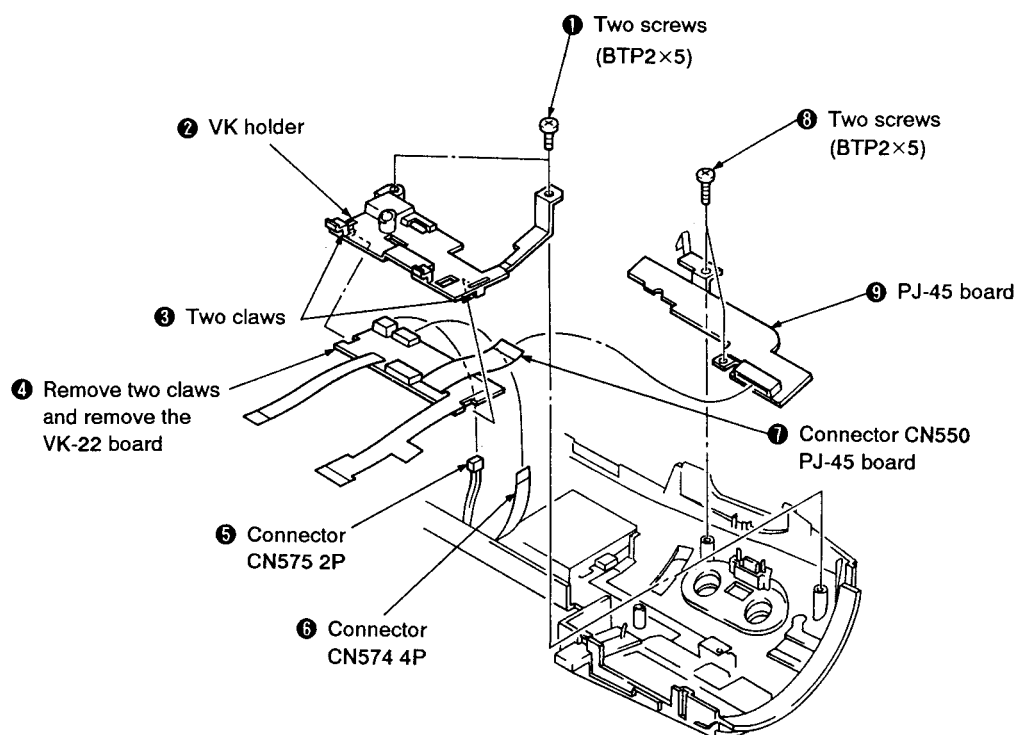
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY



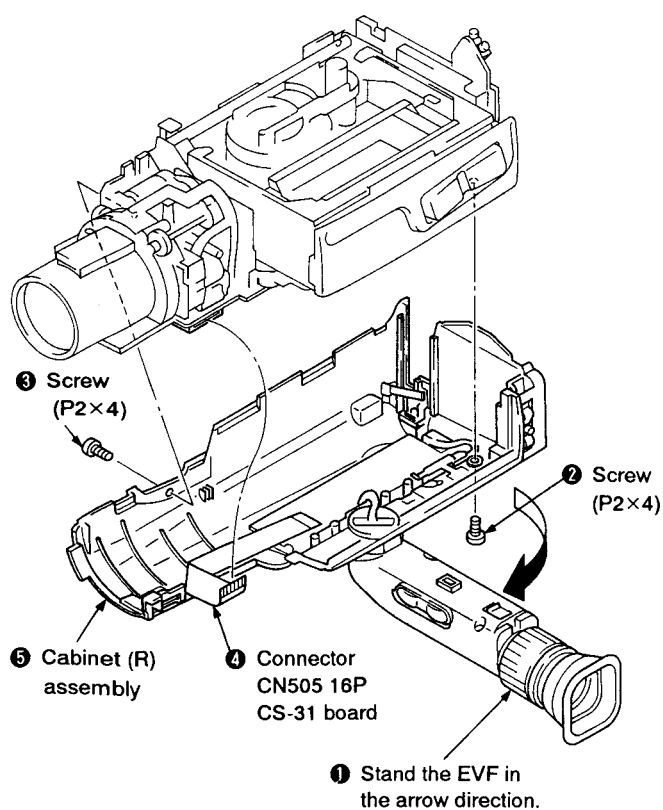
2-4. REMOVAL OF CABINET (L) ASSEMBLY



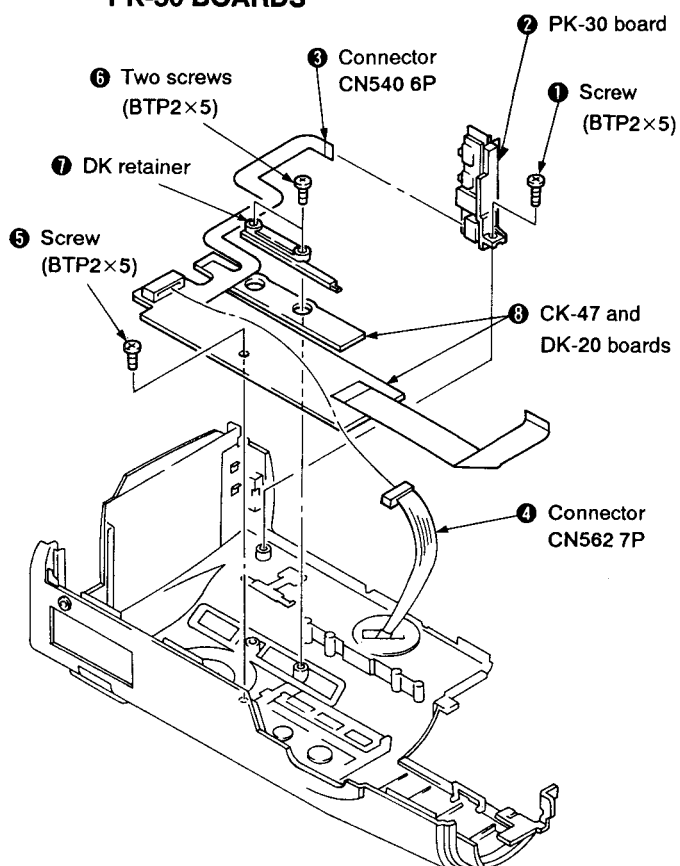
2-5. REMOVAL OF VK-22 AND PJ-45 BOARDS



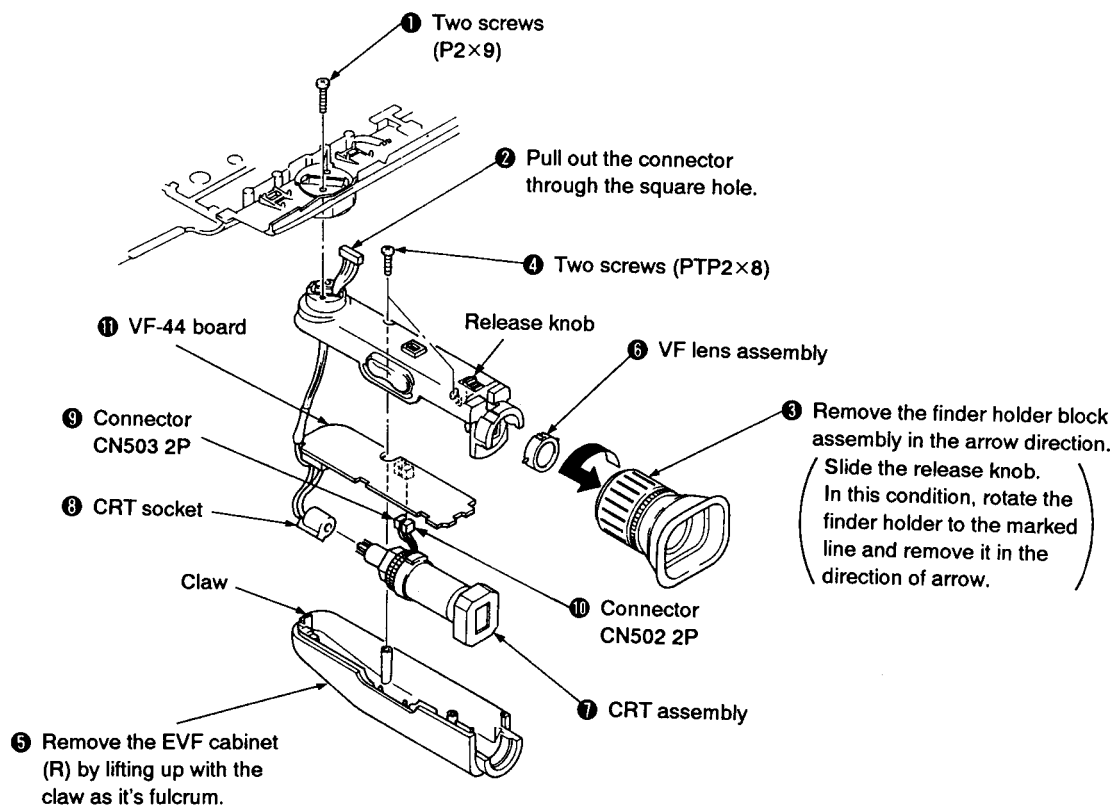
2-6. REMOVAL OF CABINET (R) ASSEMBLY



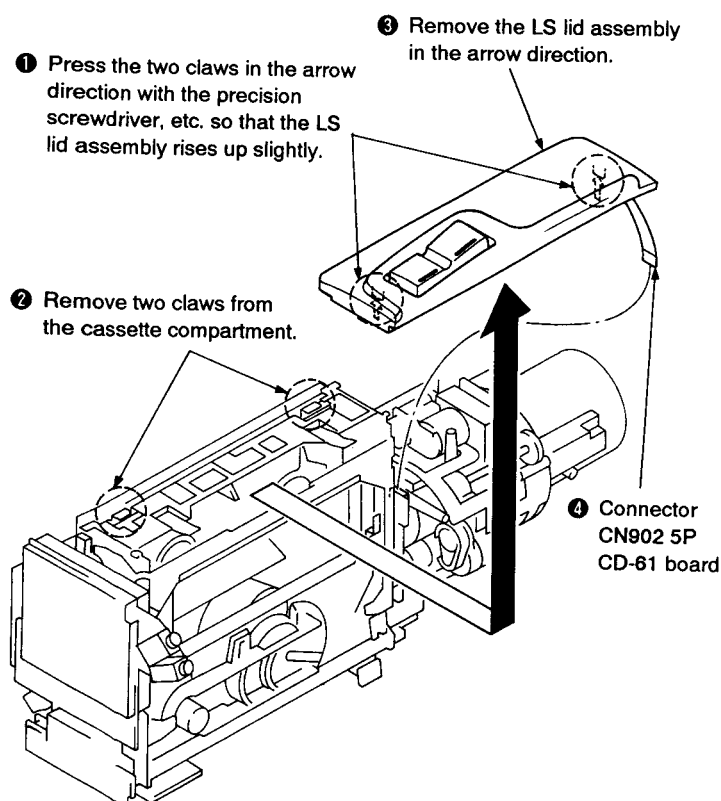
2-7. REMOVAL OF CK-47, DK-20 AND PK-30 BOARDS



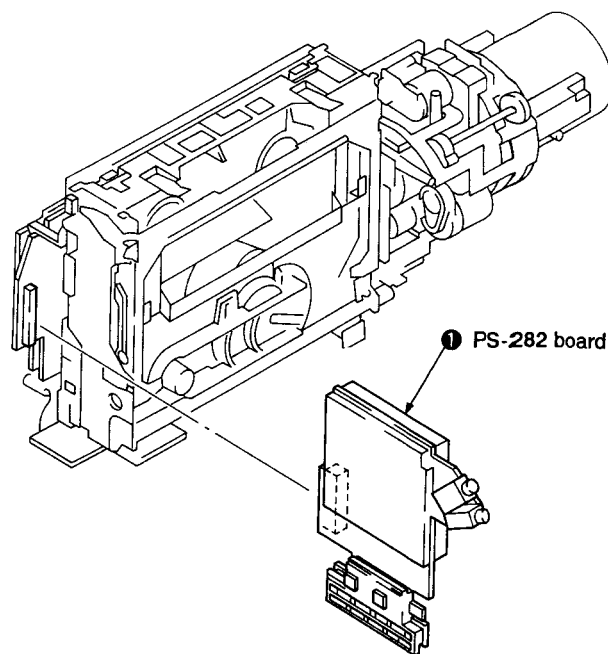
2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)



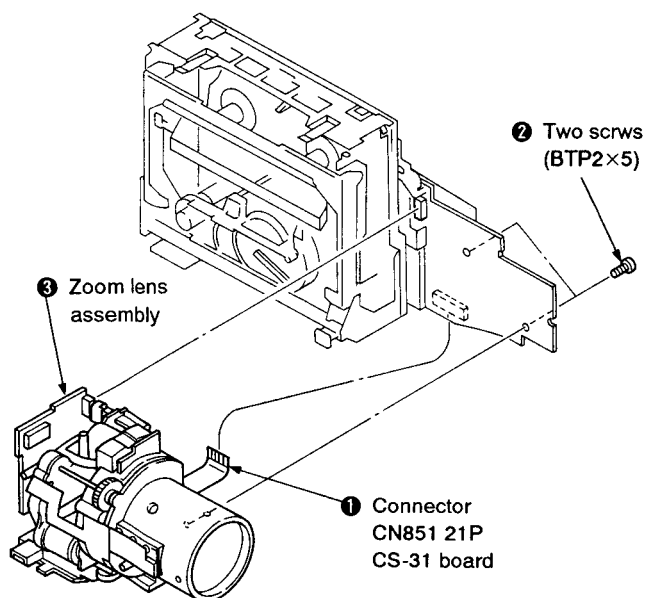
2-9. REMOVAL OF LS LID ASSEMBLY



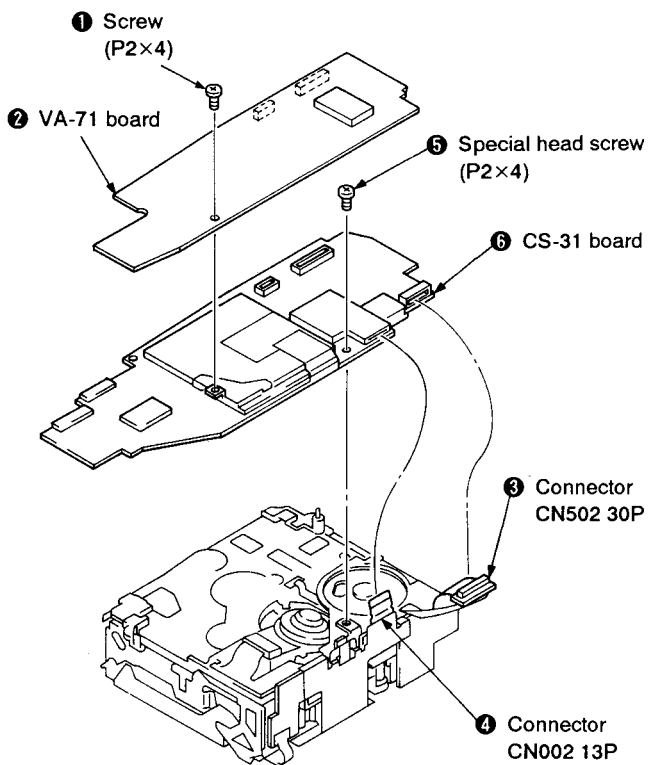
2-10. REMOVAL OF PS-282 BOARD



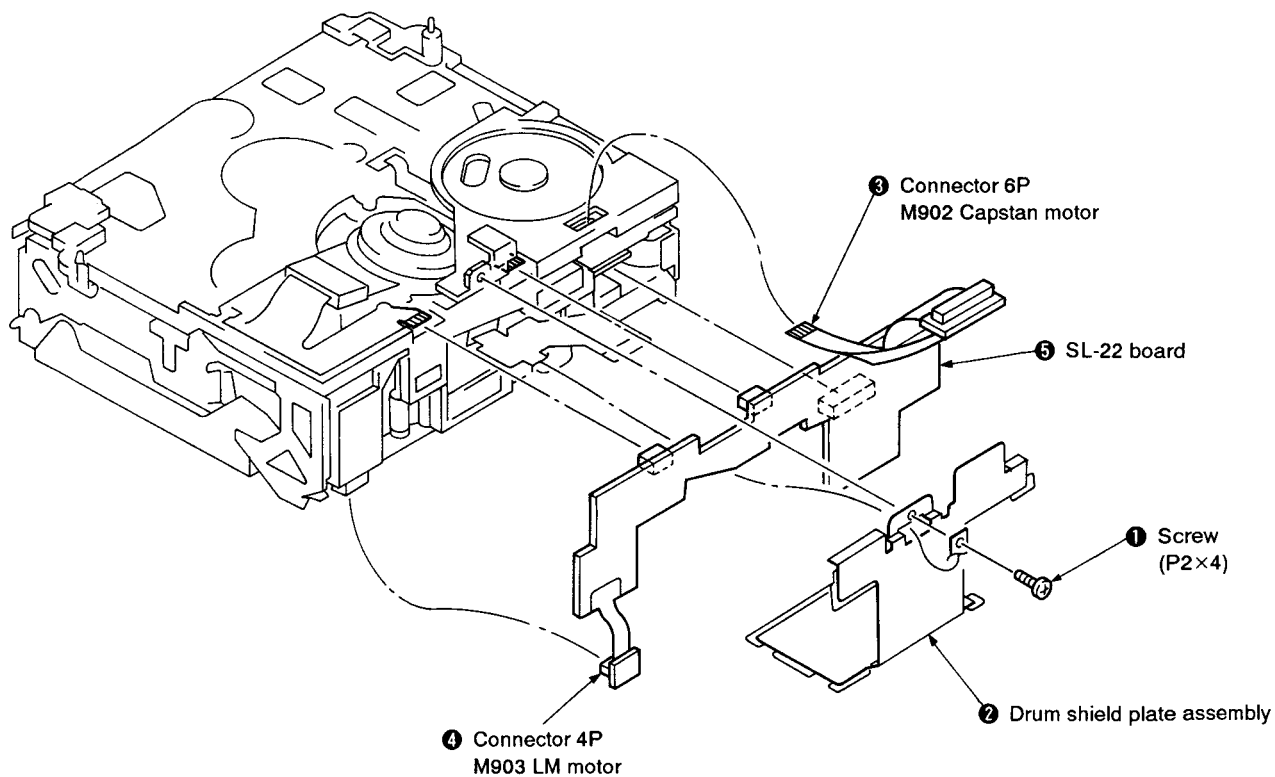
2-11. REMOVAL OF ZOOM LENS ASSEMBLY



2-12. REMOVAL OF VA-71 AND CS-31 BOARDS

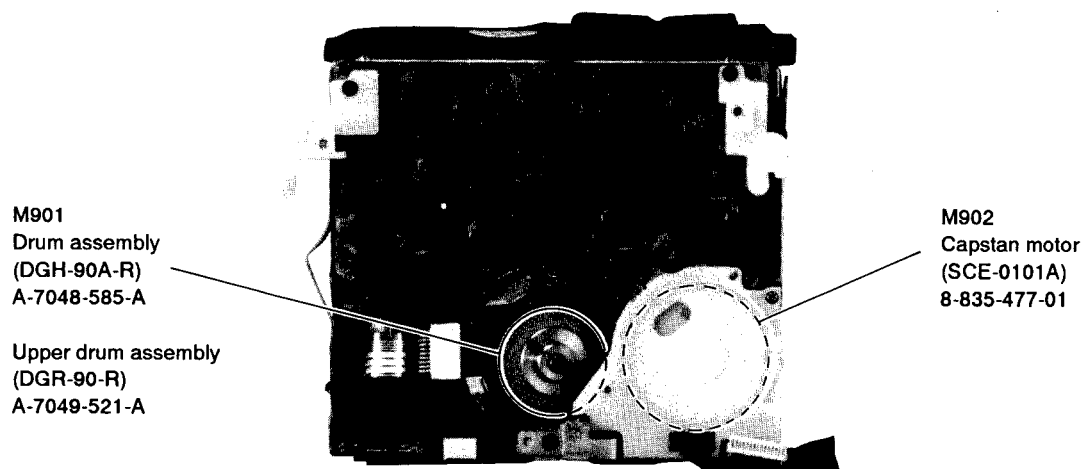


2-13. REMOVAL OF SL-22 BOARD

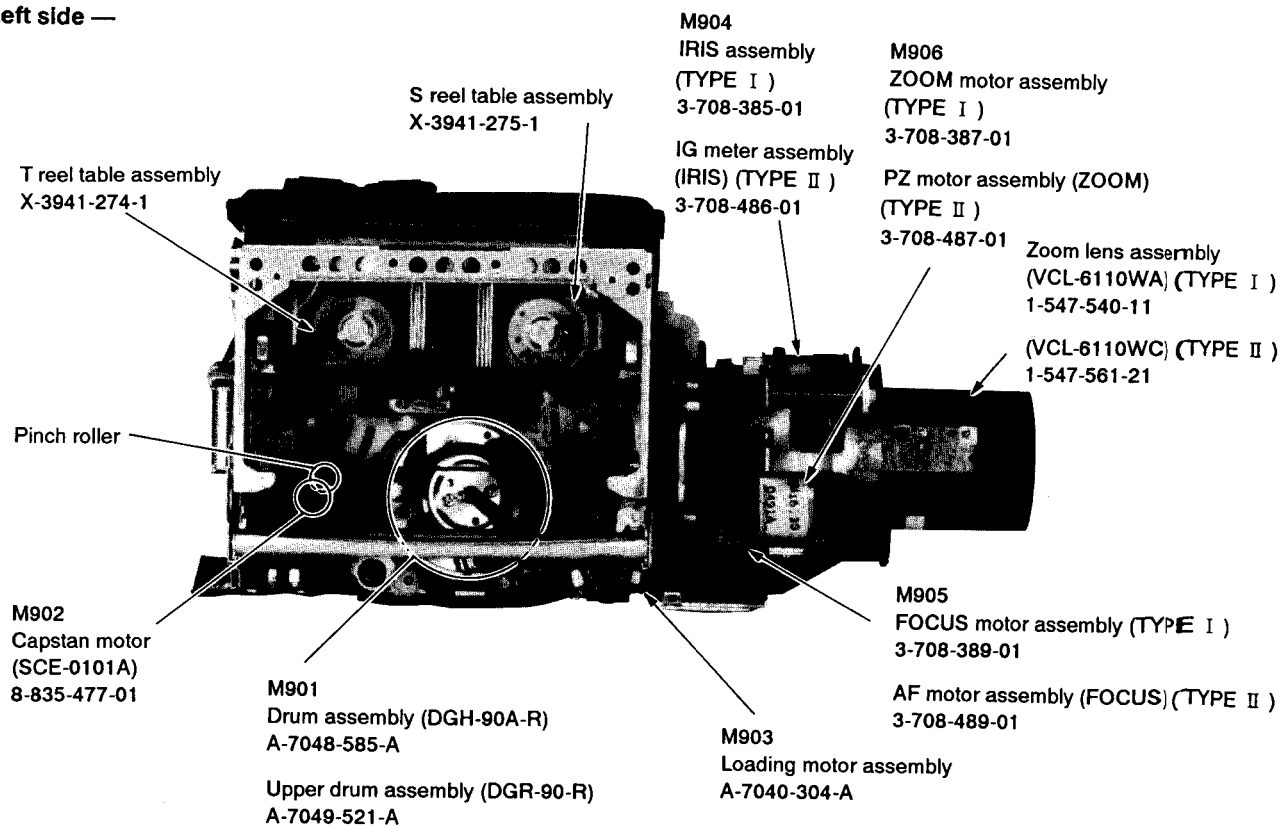


2-14. INTERNAL VIEWS

— Right side —

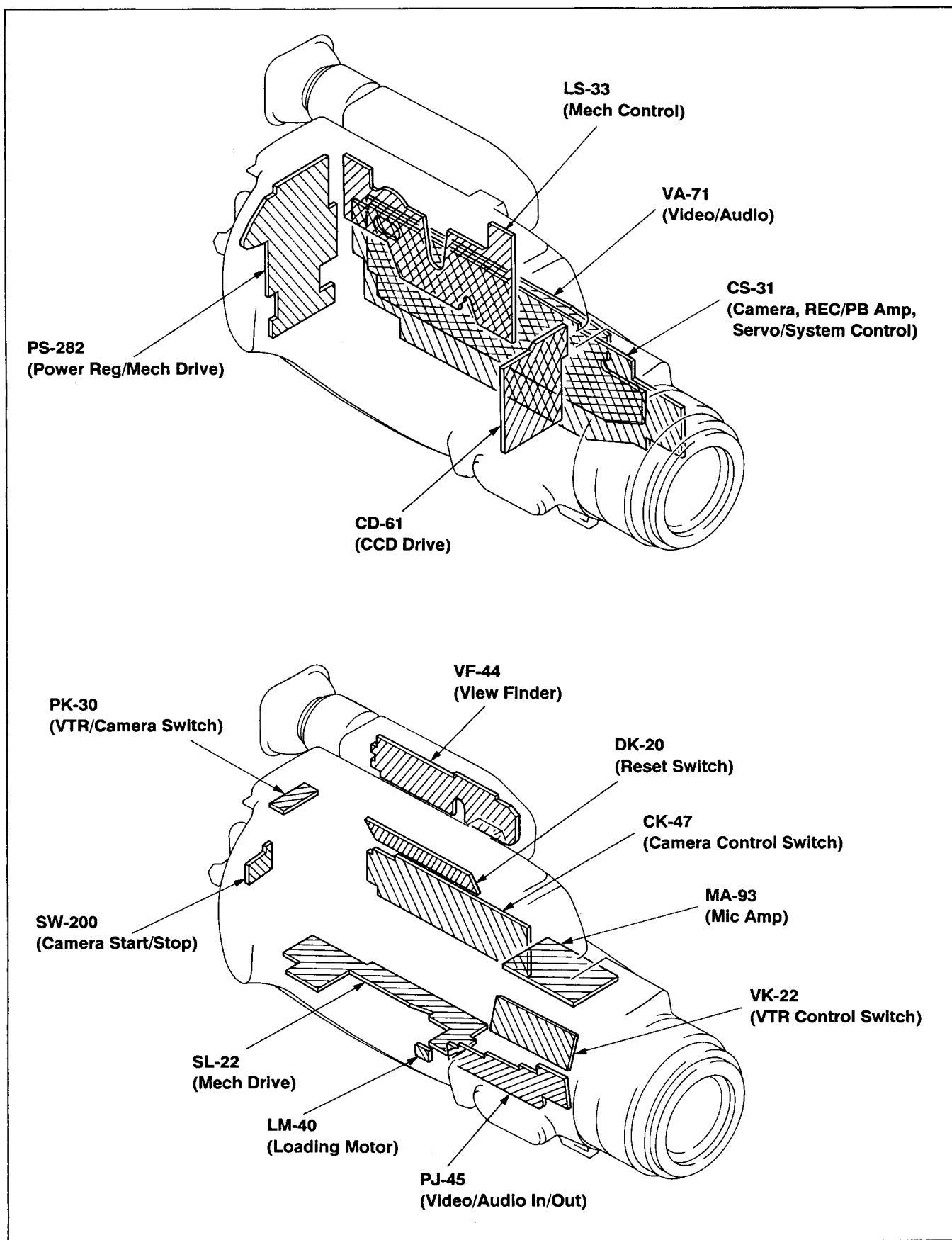


— Left side —

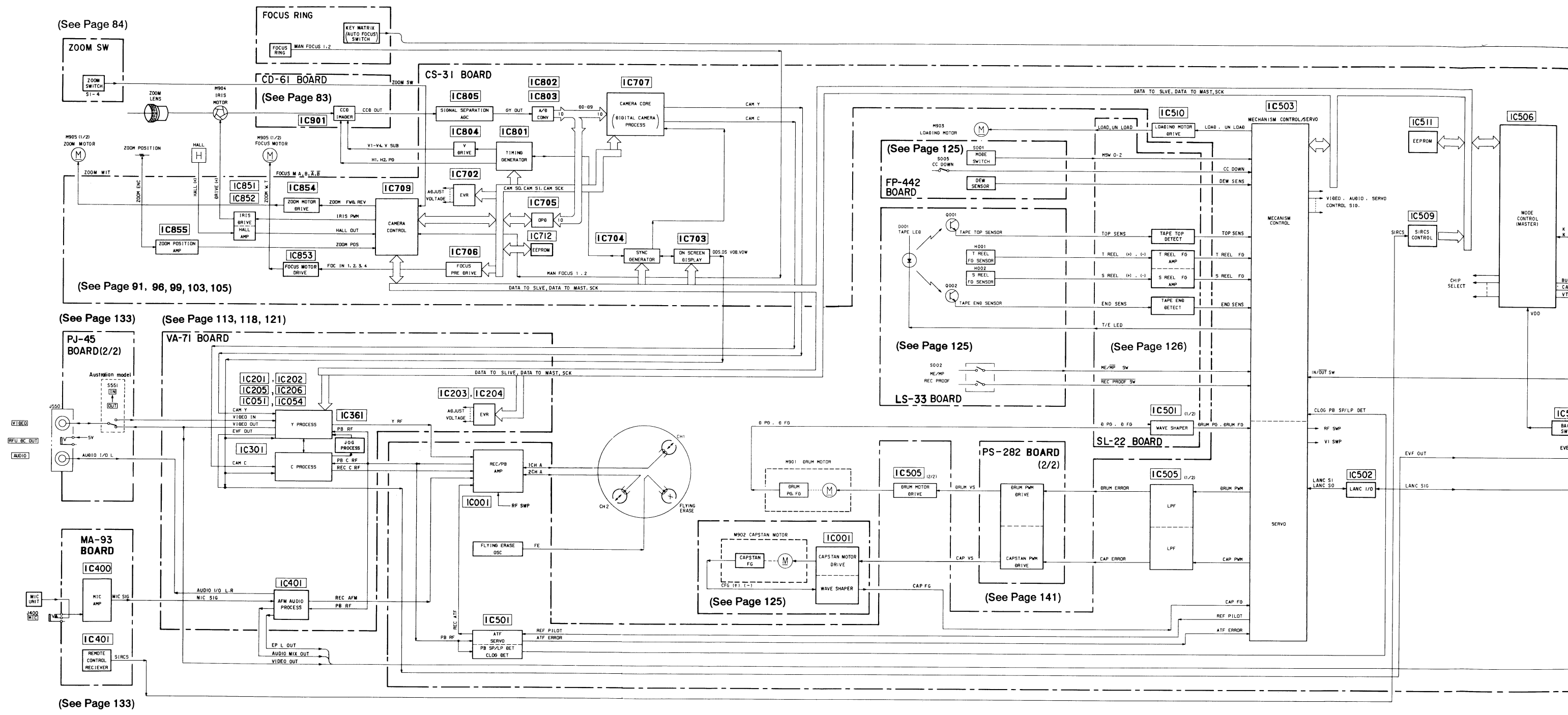


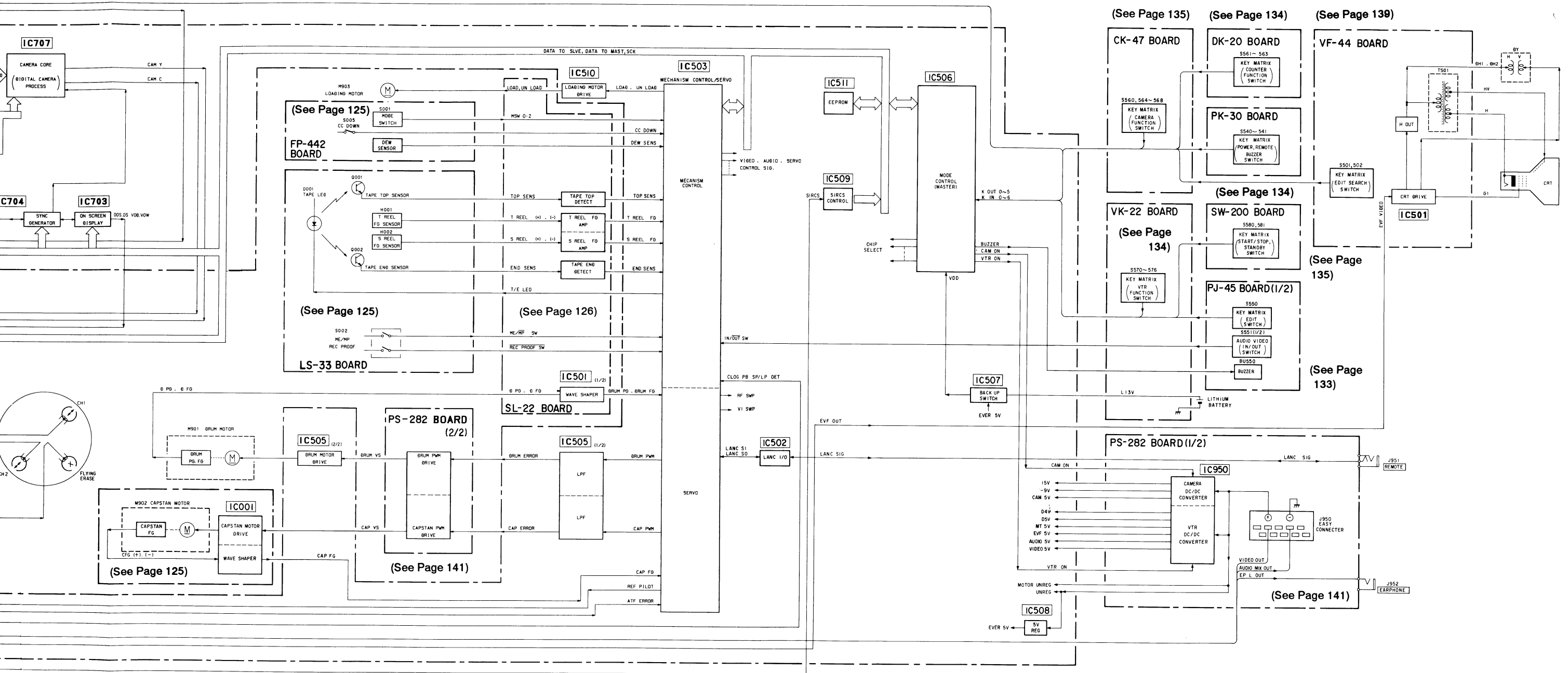
SECTION 3 DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

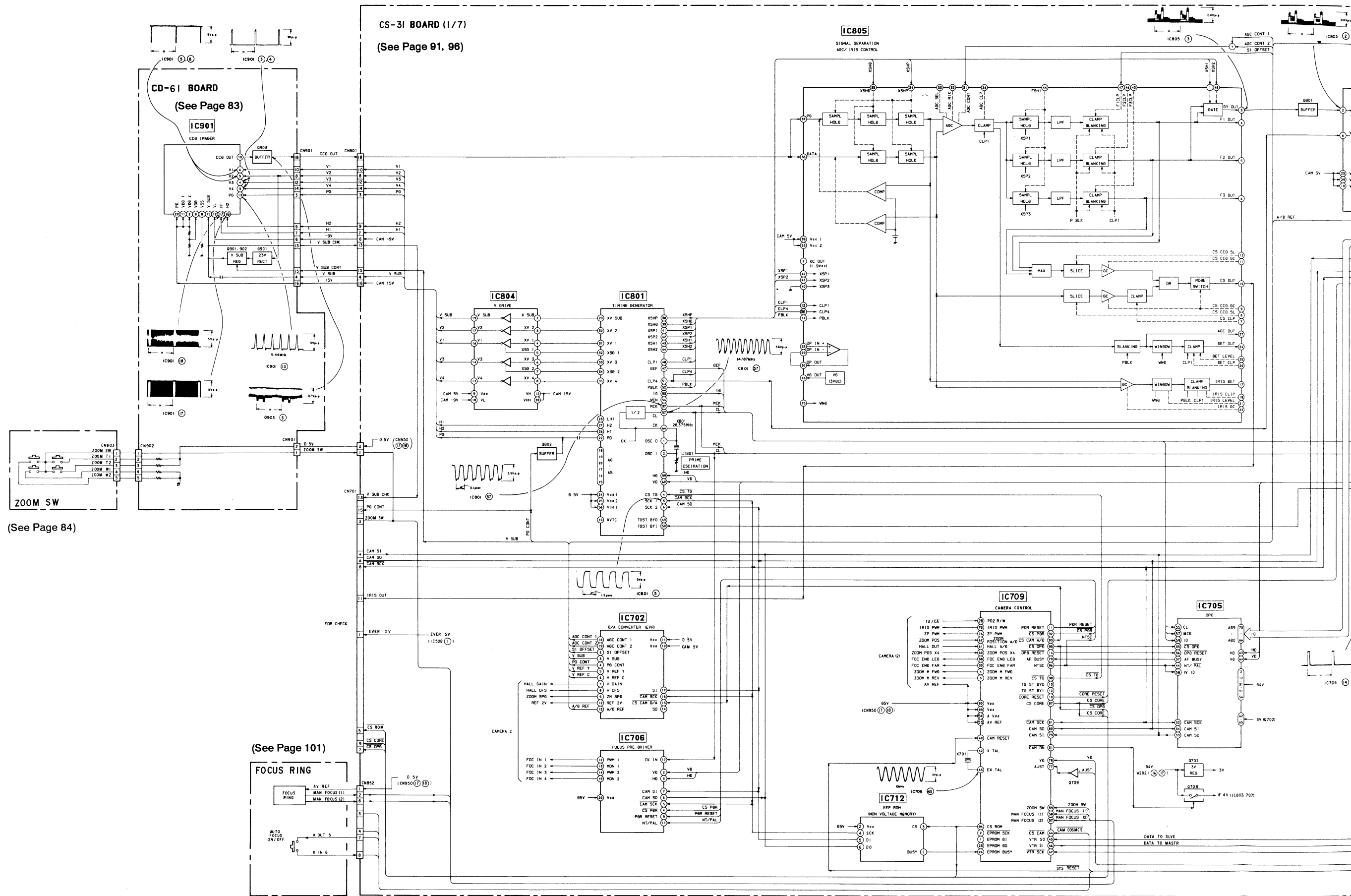


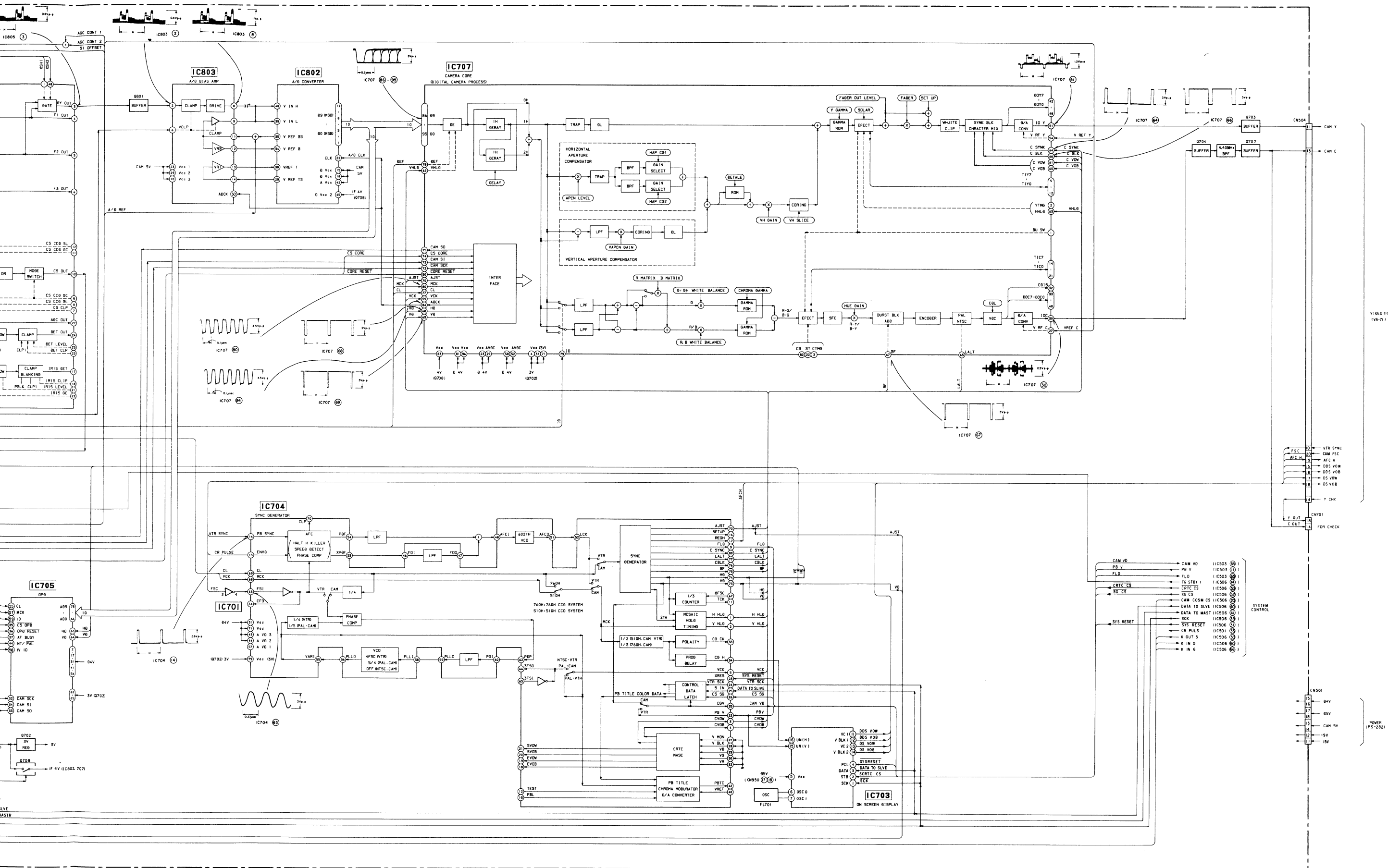
3-2. OVERALL BLOCK DIAGRAM





3-3. CAMERA (1) BLOCK DIAGRAM





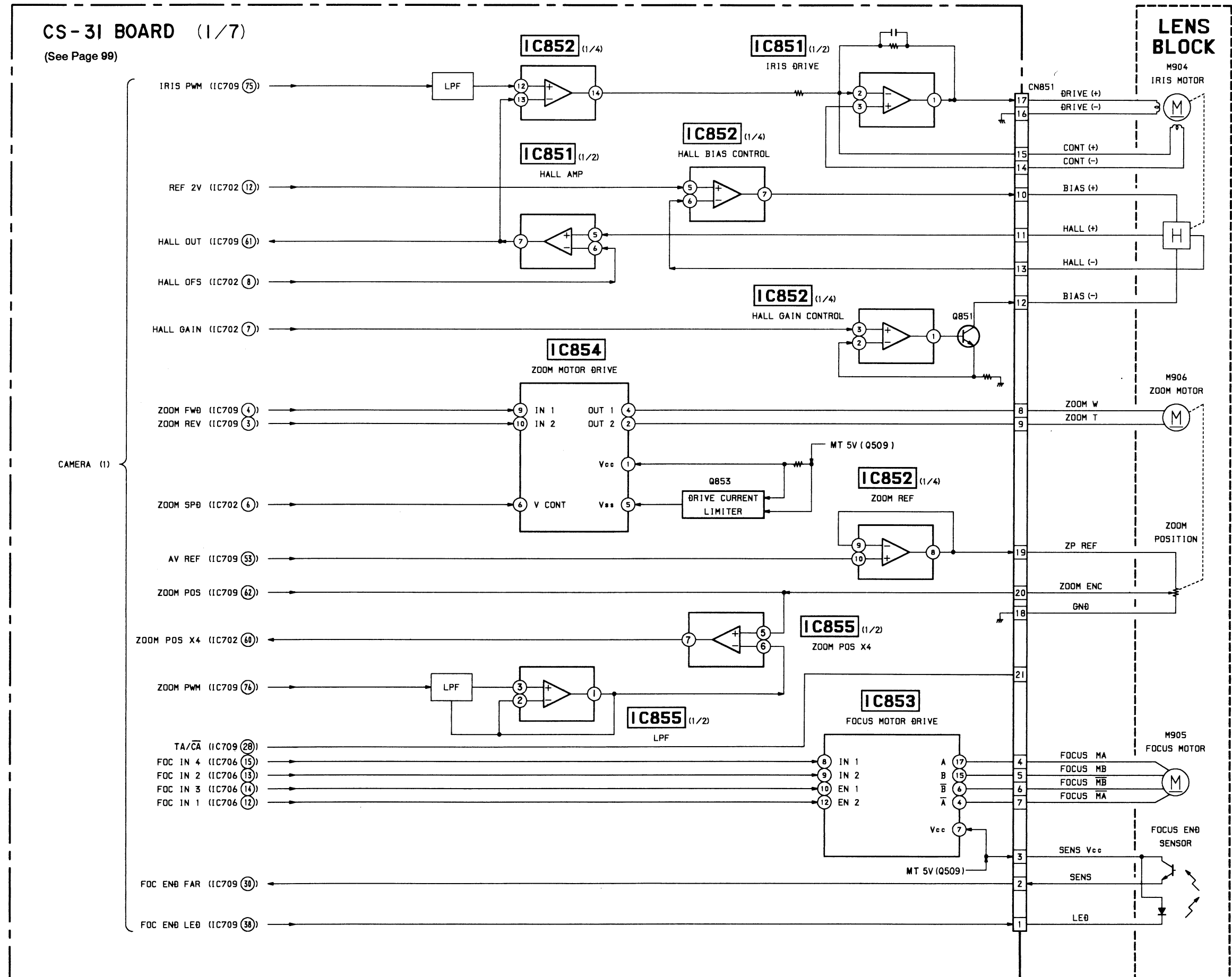
3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON CS-31 BOARD: CXP80624-299Q)

Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	EPROM SCK	O	
3	ZOOM M REV	O	
4	ZOOM M FWD	O	Zoom motor control signal. Normally "H". 20 msec period PWM signal when rotating to WIDE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	CORE RESET	O	Camera core (IC707 on CS-31 board) reset signal. Normally "H". "L" when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-31 board) reset signal. Normally "H". "L" when reset.
12	TG STBY1		Not used.
13	TG SYBY2		
14	OPD RESET	O	OPD (IC705 on CS-31 board) reset signal. "H": camera mode. "L": VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
24	EPROM BUSY	I	
25	FOC NEAR		
26	FOC FAR		Not used.
27	PD3/C	I	Fixed to +5V.
28	TA/CA	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally "L".
31	CAM ON	O	Power supply control signal. Normally "L".
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally "H" (4.4V).
39	MP		Connected to GND.
40	CAM RESET	I	Reset signal input. Normally "H". "L" when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	CS CAM	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	VTR SCK	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		

Pin No.	Signal	I/O	Function
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used.
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 μsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 μsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally "H".
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	CAM SCK	O	Serial data transfer clock
82	CS CAM		Not used.
83	PI/TO		
84	PI/PWM		
85	PI/PO		Connected to +5V.
86	PI O		
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	CS PDR	O	Chip select signal to focus predriver (IC706 on CS-31 board)
93	CS CAM D/A	O	Chip select signal to camera EVR (IC702 on CS-31 board)
94	CS ROM	O	Chip select signal to EEPROM (IC712 on CS-31 board)
95	CS OPD	O	Chip select signal to OPD (IC705 on CS-31 board)
96	NTSC	O	NTSC: "L", PAL: "H"
97	CS CORE	O	Chip select signal to camera core (IC707 on CS-31 board)
98	CS TG	O	Select signal to timing generator (IC801 on CS-31 board)
99	J STB		Not used.
100	PB6		

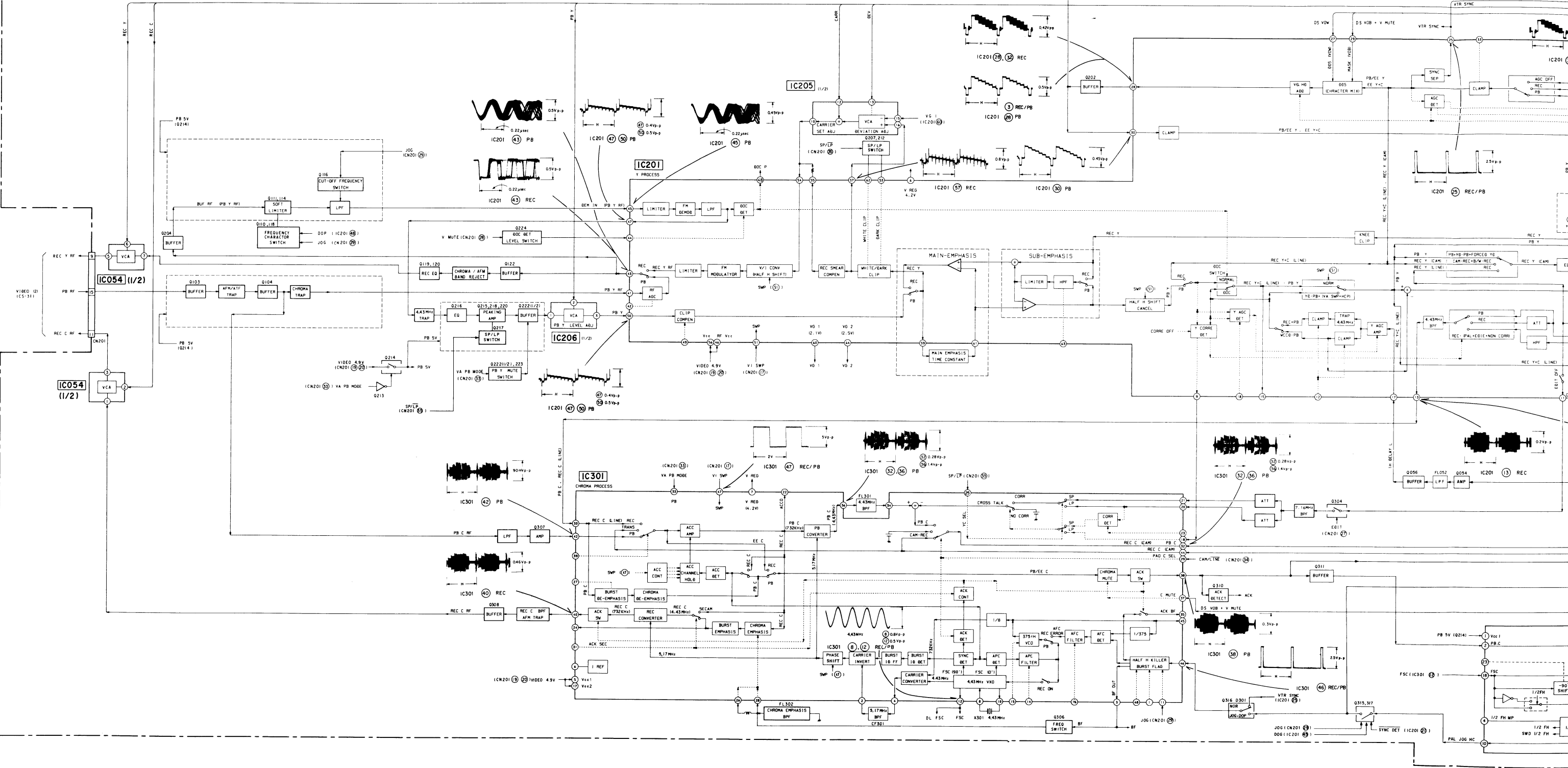
3-5. CAMERA (2) BLOCK DIAGRAM

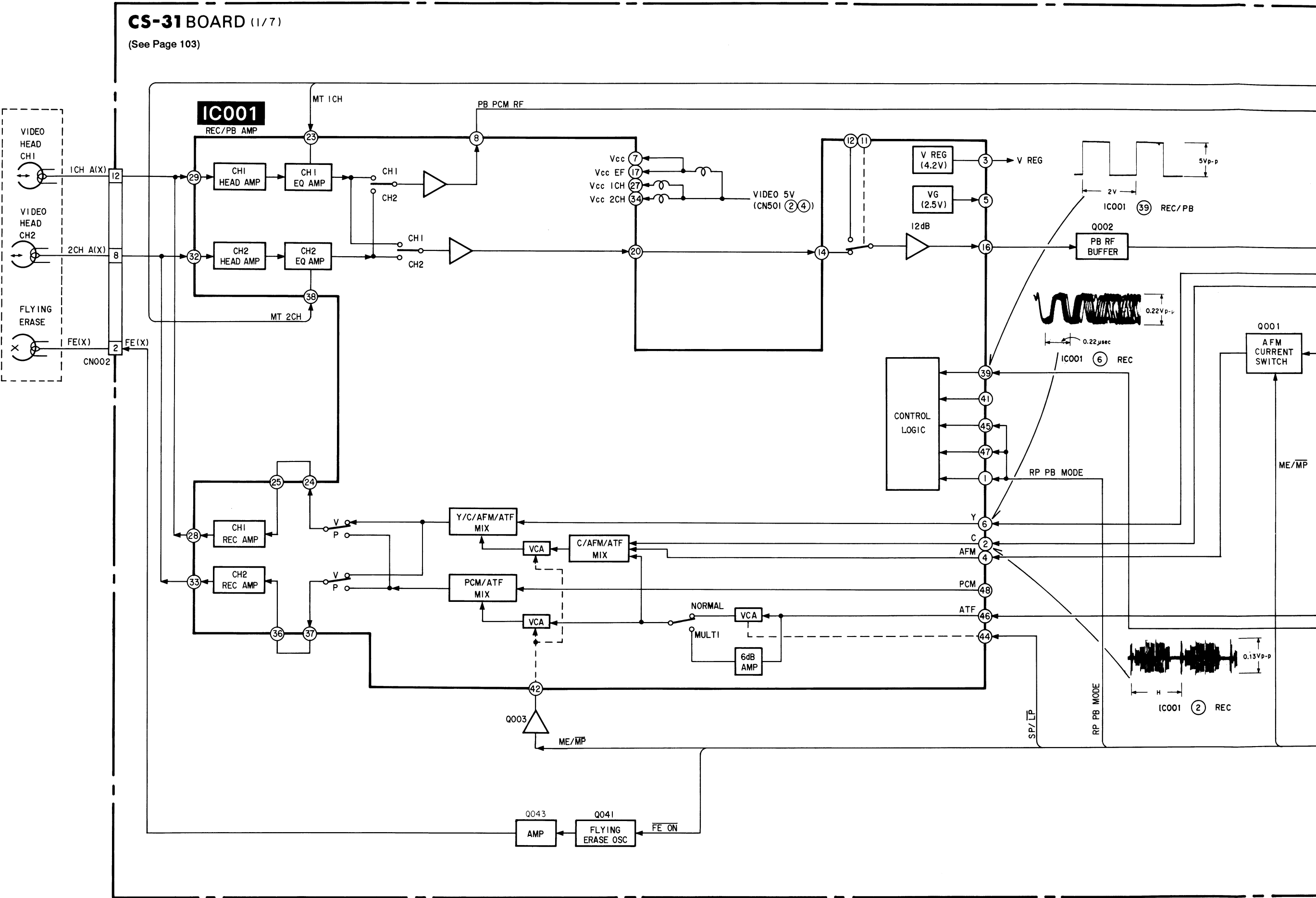
(See Page 99)

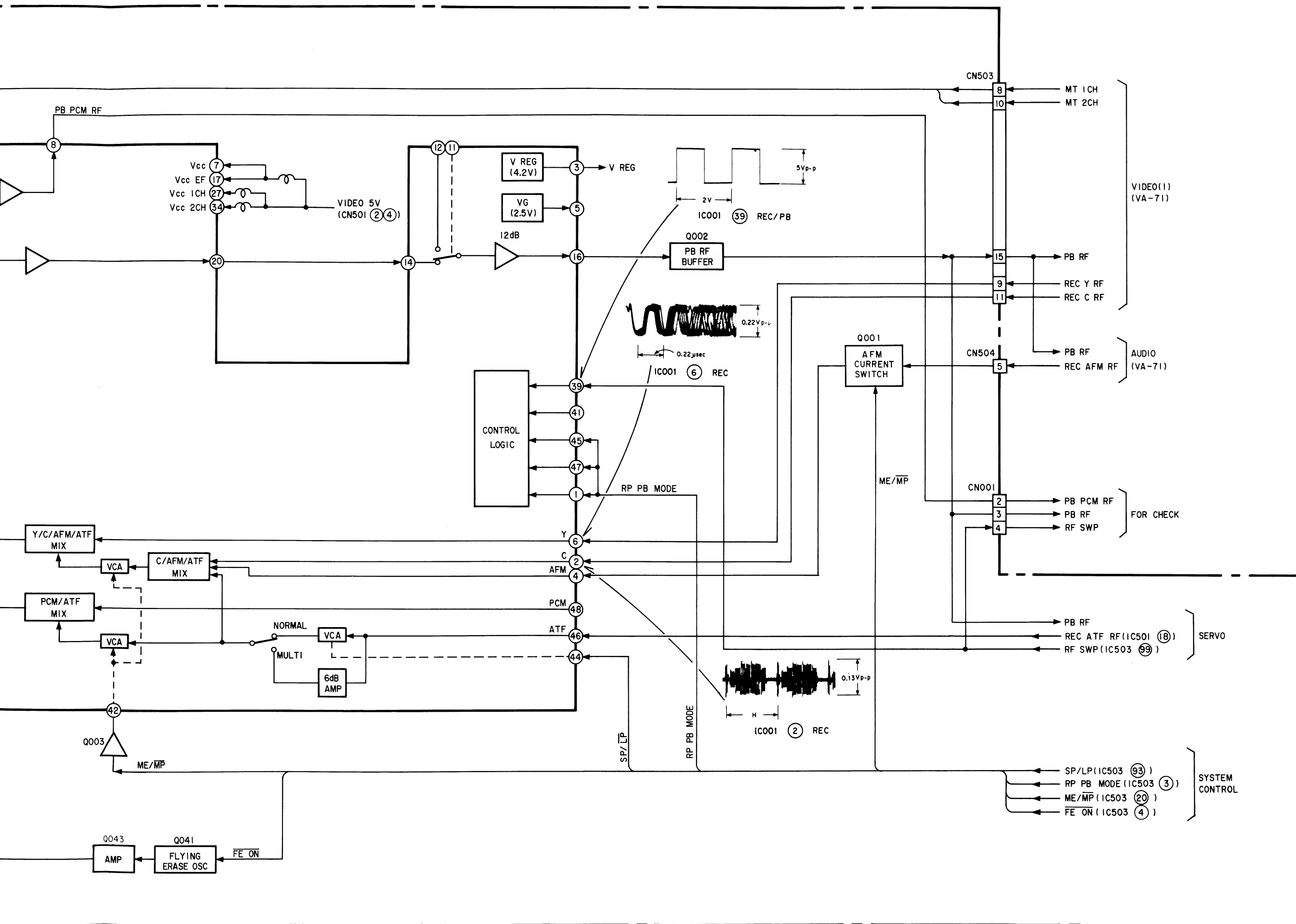


3-6. VIDEO (1) BLOCK DIAGRAM

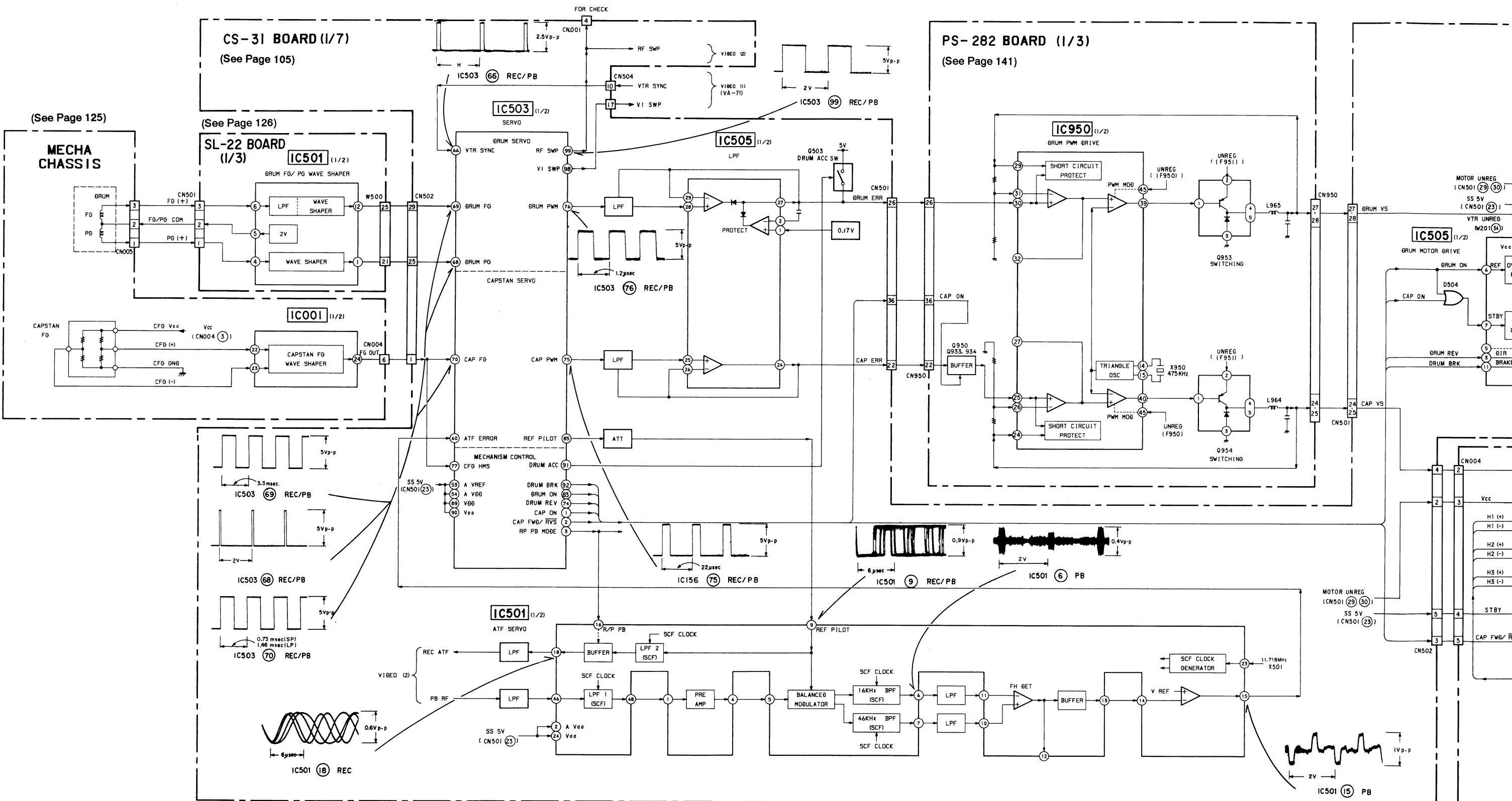
VA-71 BOARD (1/2)
(See Page 113, 118, 121)







3-8. SERVO BLOCK DIAGRAM



3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC503 ON CS-31 BOARD: CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function																																								
1	I1	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.																																								
2	PB4/PP012	CAP FWD/RVS	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.																																								
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-31 board) and ATF servo IC (IC501 on CS-31 board). "H": PB.																																								
4	PB2/PP010	FE ON	O	RP	Flying erase oscillation ON/OFF control signal. "L": oscillation.																																								
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.																																								
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.																																								
7	PC7/RT07	JACK IN/OUT	I	VA	Jack in/out switch input. "L" when input.																																								
8	PC6/RT06	1.7M DET	I	VA	Not used.																																								
9	PC5/RT05	JACK MONO/STE DET	I	VA																																									
10	PC4/RT04	INT VD	I																																										
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.																																								
12	PC2/RT018	SYNC DET OUT	O	VA	Sync detect output. "L" when Sync is detected.																																								
13	PC1/RT017	E/L DET	I	VA	Not used.																																								
14	PC0/RT016	MIC MONO/ST DET	I	AU																																									
15	PJ7	M SW 0	I	MD	Mode switch input. <table><tr><td></td><td>BL</td><td>END</td><td>EJECT</td><td>USE</td><td>LOAD</td><td>READY</td><td>TURN</td><td>REC/PB</td><td>FF</td></tr><tr><td>M SW 0</td><td>H</td><td>L</td><td>L</td><td>H</td><td>L</td><td>H</td><td>H</td><td>L</td><td>L</td></tr><tr><td>M SW 1</td><td>H</td><td>H</td><td>L</td><td>L</td><td>L</td><td>L</td><td>H</td><td>H</td><td>L</td></tr><tr><td>M SW 2</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>L</td><td>L</td><td>L</td><td>L</td></tr></table>		BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF	M SW 0	H	L	L	H	L	H	H	L	L	M SW 1	H	H	L	L	L	L	H	H	L	M SW 2	H	H	H	H	H	L	L	L	L
	BL	END	EJECT	USE		LOAD	READY	TURN	REC/PB	FF																																			
M SW 0	H	L	L	H		L	H	H	L	L																																			
M SW 1	H	H	L	L		L	L	H	H	L																																			
M SW 2	H	H	H	H	H	L	L	L	L																																				
16	PJ6	M SW 1	I	MD																																									
17	PJ5	M SW 2	I	MD																																									
18	PJ4	CC DOWN	I	MD	Cassette compartment down switch input. "L": down.																																								
19	PJ3	REC PROOF	I	MD	Erasure protection switch input. "L" when REC prohibit.																																								
20	PJ2	ME/MP	I	MD	ME/MP switch input. "L": MP, "H": ME.																																								
21	PJ1	HG/NOR	I	MD	Connected to GND.																																								
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. "H": mute.																																								
23	PD7	LINE MIX	I	VA	Not used.																																								
24	PD6	MAT SEL 1	I	VA																																									
25	PD5	MAT SEL 2	I	VA																																									
26	PD4	MAT ON/OFF	O	VA																																									
27	PD3	E MODE	O	VA																																									
28	PD2	CAM/LINE	O	VA	Camera input/line input select signal. "H" when camera input.																																								
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. "H": ON.																																								
30	PD0	EDIT	O	VA	Video circuit EDIT/NORMAL switch signal. "L": EDIT.																																								
31	PH7	UNLOAD	O	SS	Loading motor control signal. "H" or "H" pulse when unloading.																																								
32	PH6	LOAD	O	SS	Loading motor control signal. "H" or "H" pulse when loading.																																								
33	PH5	LM LIM COM	O	SS	Loading motor limiter control signal. Temporary "H" when loading.																																								
34	PH4	COMP REC	O	VA	Not used.																																								
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally "L".																																								
36	PH2		O		N.C.																																								
37	PH1		O																																										
38	PH0	REEL HALL CONT	O	SS	Reel FG sensor (HALL element) power supply control signal. Not used.																																								
39	MP	MP			Connected to GND.																																								
40	RST	RESET	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.																																								
41	VSS	VSS			GND																																								
42	XTAL	XTAL	I	SS	11.718 MHz clock oscillation circuit.																																								
43	EXTAL	EXTAL	O	SS																																									
44	CSO	COSMO CS	I	MODE CON	Chip select signal from mode control microprocessor (CS-31 board IC506)																																								
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.																																								

Pin No.	Port Name	Signal	I/O	Connection	Function
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. “H”: mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally “L”, “H” pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally “L”, “H” pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. “L” when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EX11	PG7 (N.C.)			Connected to GND.
64	PG6/EX10	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. “L”: LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period “H” pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.4 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1389 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period “H” pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μ sec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μ sec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	S JACK IN			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally “H”, “L” when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. “H” when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. “L” when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD

Pin No.	
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-31 board) and

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H	H	L
L	L	L

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nal. Not used.

reset.

31 board

Pin No.	Port Name	Signal	I/O	Connection	Function
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EX11	PG7 (N.C.)			Connected to GND.
64	PG6/EX10	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.4 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1389 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μ sec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μ sec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	S JACK IN			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD

Pin No.	Port Name	Signal	I/O	Connection	Function
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally "L". "H" pulse when SLOW mode.
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally "L".
93	PA5/PP05	SP/LP	O	VA	SP/LP select signal. "L": LP.
94	PA4/PP04		O		N.C.
95	PA3/PP03	VIDEO O SW	O	VA	VIDEO OUT inhibit signal. "H": inhibit.
96	PA2/PP02	VIDEO I SW	O	VA	VIDEO IN/OUT select signal. "L": VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 25 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 25 Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC506 ON CS-31 BOARD: μ PD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC511 on CS-31 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-31 board). Normally "L".
15	S26/BP2	AUDIO IN/ $\overline{\text{OUT}}$	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Not used.
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-31 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Not used.
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on CS-31 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor. Not used.
26	VLC0	VCC 0	I		Power source 0 input
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	BATT IN	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/ $\overline{\text{SCK}}$	SCK	O	all	Serial clock output terminal, Serial clock (2 μ S) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 μ S) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 μ S) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-31 board).

Pin No.	Port Name	Signal	I/O	Connection	Function
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Not used.
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "VTR" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, -9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-71 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-71 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-31 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-31 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-31 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			N.C.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	Cassette compartment lock switch input. "L": Lock.
66	P72/KP6	K IN 6	I	all	
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	System reset input. "L": Reset, Normally: "H".
68	RESET	RESET	I		N.C.
69	S0	CLK CHK	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
70	S1	S1	O		
71	S2	S2	O		
72	S3	S3	O		
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (CS-31 BOARD)

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB-PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC *17	REC *17 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
SP/LP	O	IC503 ㉓	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2	*2	*16	H/L	H/L	*16	*2	*2	H	H
VA PB MODE	O	IC503 ㉗	L	L	L	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE *13	O	IC503 ㉘	L	L	L	H	H	L	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
VIDEO MUTE	O	IC503 ㉚	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
CAM/LINE	O	IC503 ㉛	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
JOG VD	O	IC503 ㉝	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
RP PB MODE	O	IC503 ㉞	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
FE ON	O	IC503 ㉟	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
RF SWP	O	IC503 ㊱	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC503 ㉞	L	L	L	H	H	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
VIDEO CS	O	IC506 ㉟	V period "L" pulse																					
VIDEO D/A CS	O	IC506 ㊱	V period "H" pulse																					
DATA TO MSTR	I	IC506 ㊱	V period "L" pulse																					
DATA TO SLVE	O	IC506 ㊱	V period pulse train																					
SCK	I	IC506 ㉛	V period "H" pulse																					
PB SP/LP DET	I	IC503 ㉞	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
CLOG	I	IC503 ㉛	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
VTR SYNC	I	IC503 ㉞	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs discrimination result of the mode just before. "H": SP mode, "L": LP mode.

*2. Outputs discrimination result of the playback tape. "H": SP mode, "L": LP mode.

*3. Edit search button pressed when playback pause mode.

*5. False VD signal

*7. 25 Hz duty 50% pulse (synchronized with drum rotation)

*10. "H": SP recording area on tape. "L": LP recording area.

*11. "H": no recording area or drop out area on tape. Head clog detection input.

*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)

*13. "H" during camera mode load/unload.

*14. "L" when external input (video) present. "H" when other cases.

*15. "H" when tape no signal. "L" when other cases.

*16. By REC MODE switch. "H": SP mode, "L": LP mode.

*17. Australian model only.

3-12-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE															CAMERA MODE						
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB- PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC *14	REC *14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
T.REEL FG	I	IC503 ㉔	—	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1	*1	*1
S.REEL FG	I	IC503 ㉕	—	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1	*1	*1
ATF ERROR	I	IC503 ㉖	—	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC503 ㉗	—	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC503 ㉘	—	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC503 ㉙, ㉚	—	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC503 ①	L	H	H	H	H	H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
REF PILOT	O	IC503 ㉛	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
DRUM FWD/RVS *10	O	IC503 ㉜	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ RVS	O	IC503 ②	L	H	L	H	L	H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
DRUM PWM	O	IC503 ㉝	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC503 ㉞	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
LM LIM CONT *11	O	IC503 ㉟	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC503 ㊱	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC	O	IC503 ㊲	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
DRUM BRK	O	IC503 ㊳	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*1. Inputting waveform which is similar to sine wave according to reel rotation.

*2. ATF error voltage input

*3. One PG pulse input per one drum rotation, approx. 25 Hz.

*4. 12 FG pulses input per one drum rotation, approx. 300 Hz.

*5. 520 FG pulses input per one capstan rotation. Approx. 1389 Hz when REC/PB (SP). 697 Hz when PB (LP).

*6. Four frequencies output synchronized with drum rotation. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz

*7. f2 (117.19 kHz) output

*8. “H” pulse when tape run.

*9. 21.5 μsec period PWM signal

*10. Normally “H”. Temporary “L” when load (drum reverse rotation).

*11. Temporary “H” when cassette loading (finger catch protection).

*12. “H”: approx. 1.3 Vdc

*13. Edit search button pressed when playback pause mode.

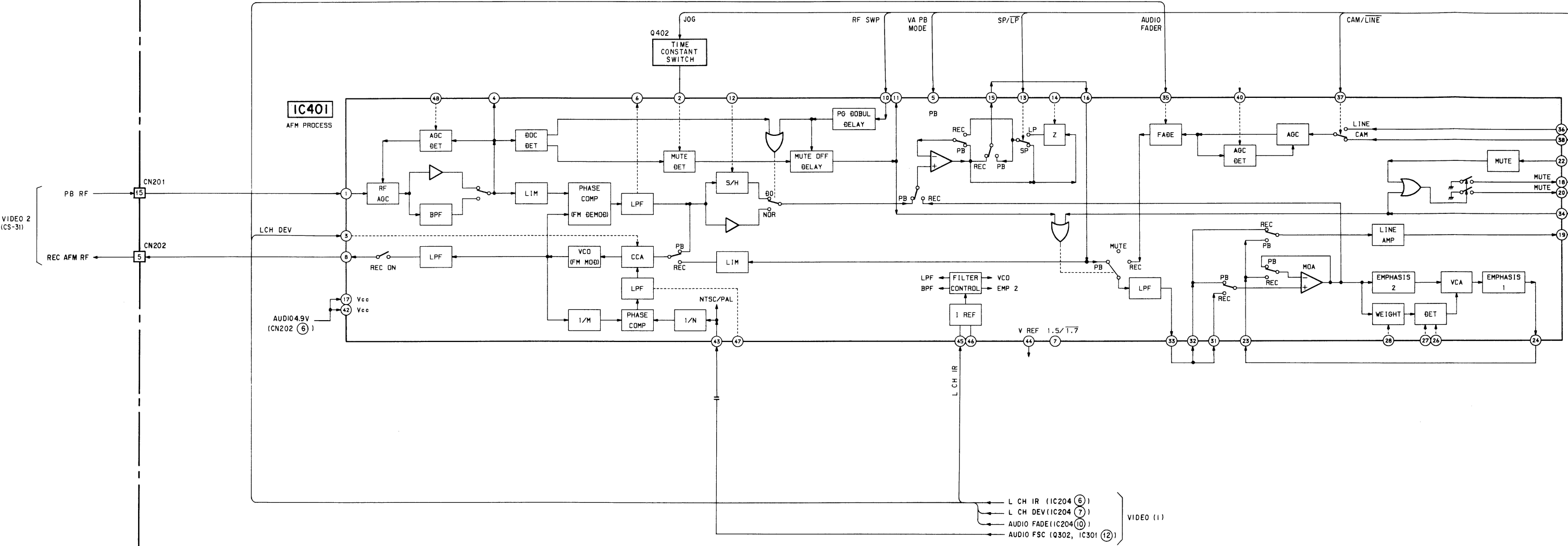
*14. Australian model only.

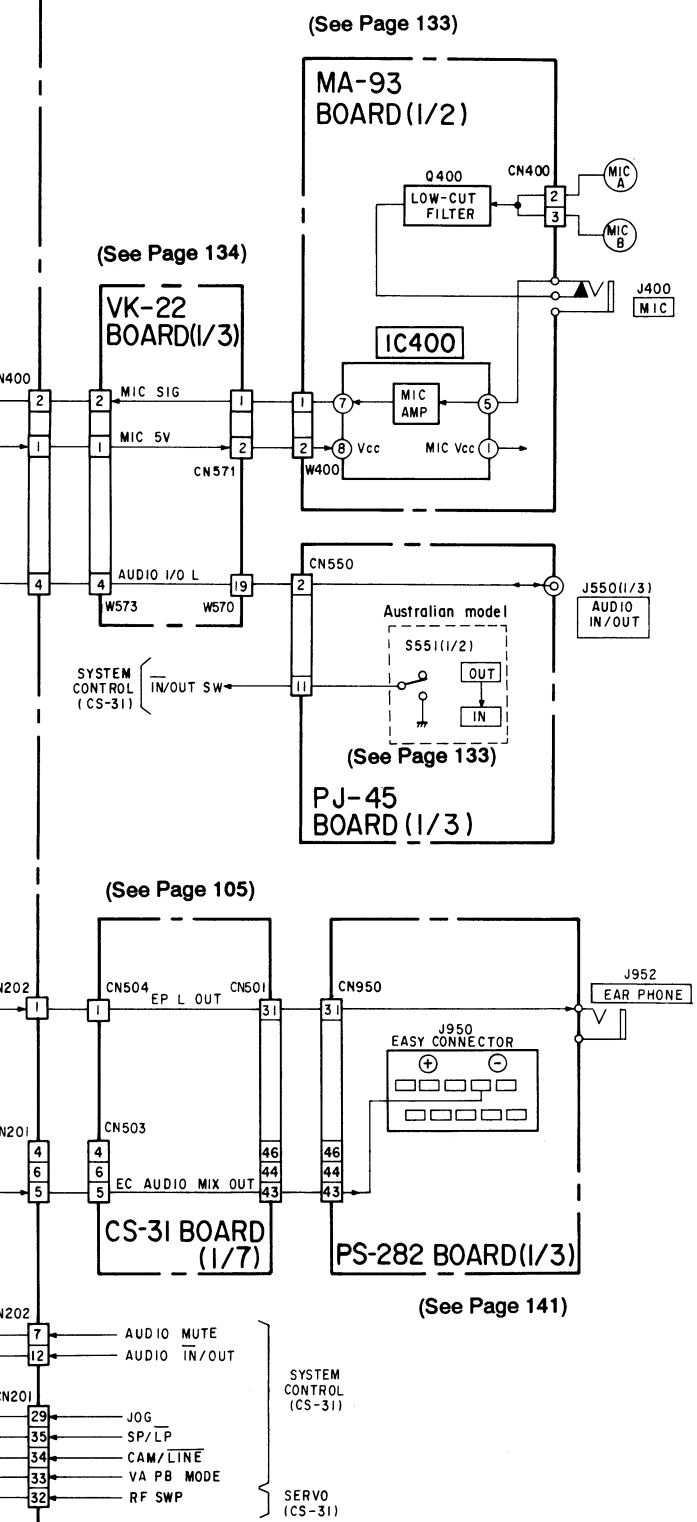
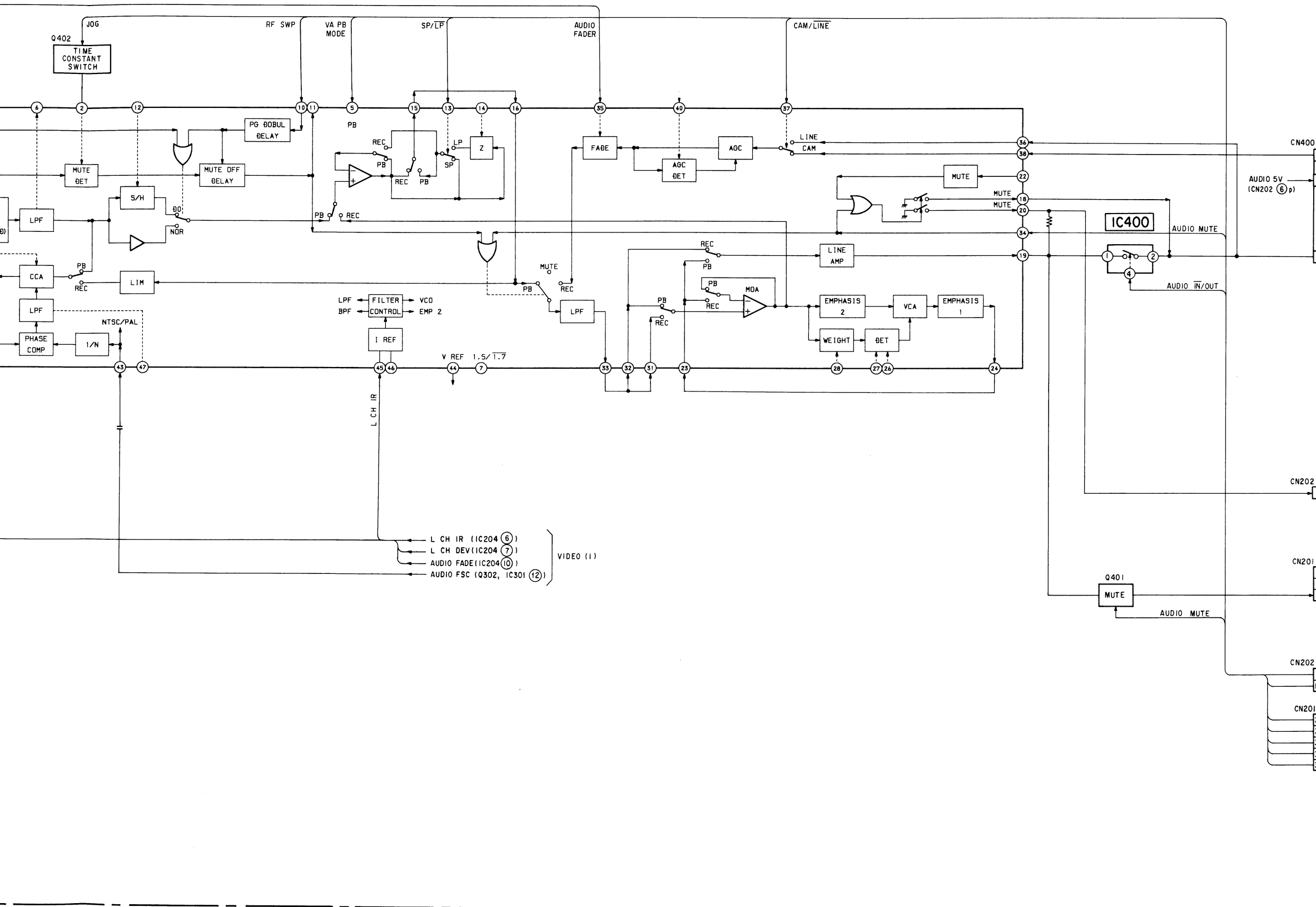
VTR MODE								CAMERA MODE						
SEARCH REVIEW	PB- PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC *14	REC *14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
					FWD	REV					FWD	RVS	FWD	RVS
*1	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1	*1	*1
*1	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1	*1	*1
*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*7. f2 (117.19 kHz) output
*8. “H” pulse when tape run.
*9. 21.5 μsec period PWM signal
*10. Normally “H”. Temporary “L” when load (drum reverse rotation).
*11. Temporary “H” when cassette loading (finger catch protection).
*12. “H”: approx. 1.3 Vdc
*13. Edit search button pressed when playback pause mode.
*14. Australian model only.

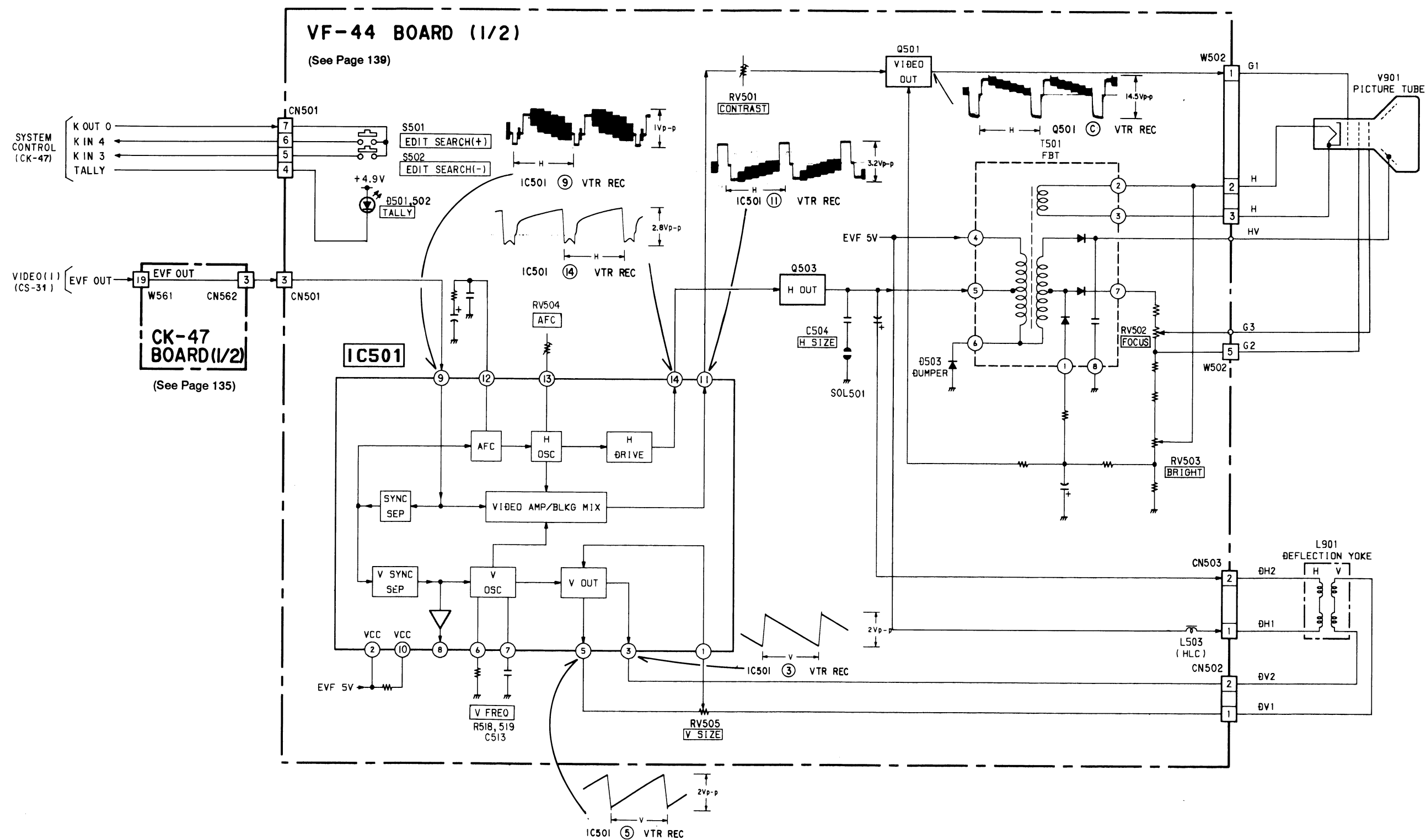
3-13. AUDIO BLOCK DIAGRAM

VA-71 BOARD (1/2)
(See Page 121)

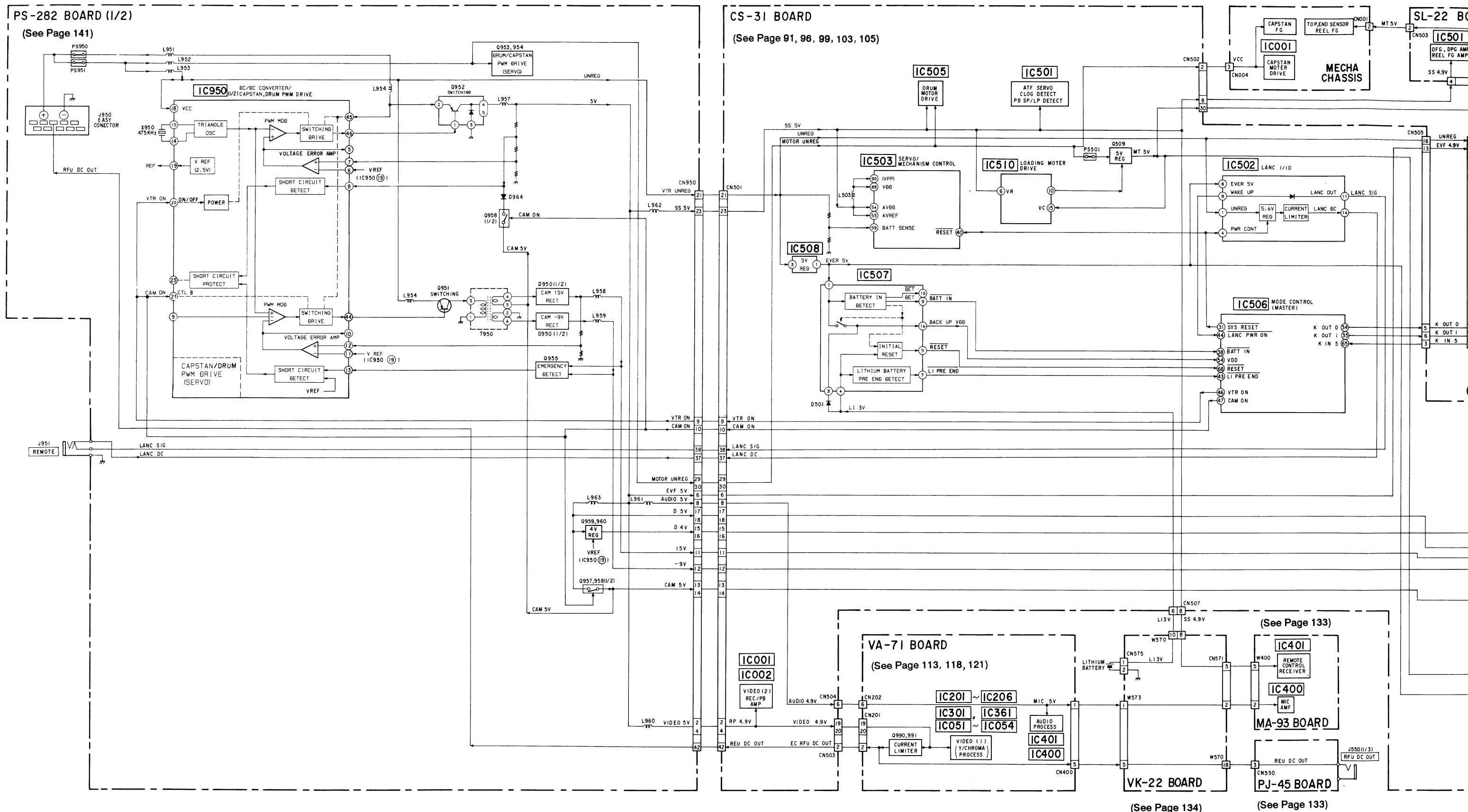


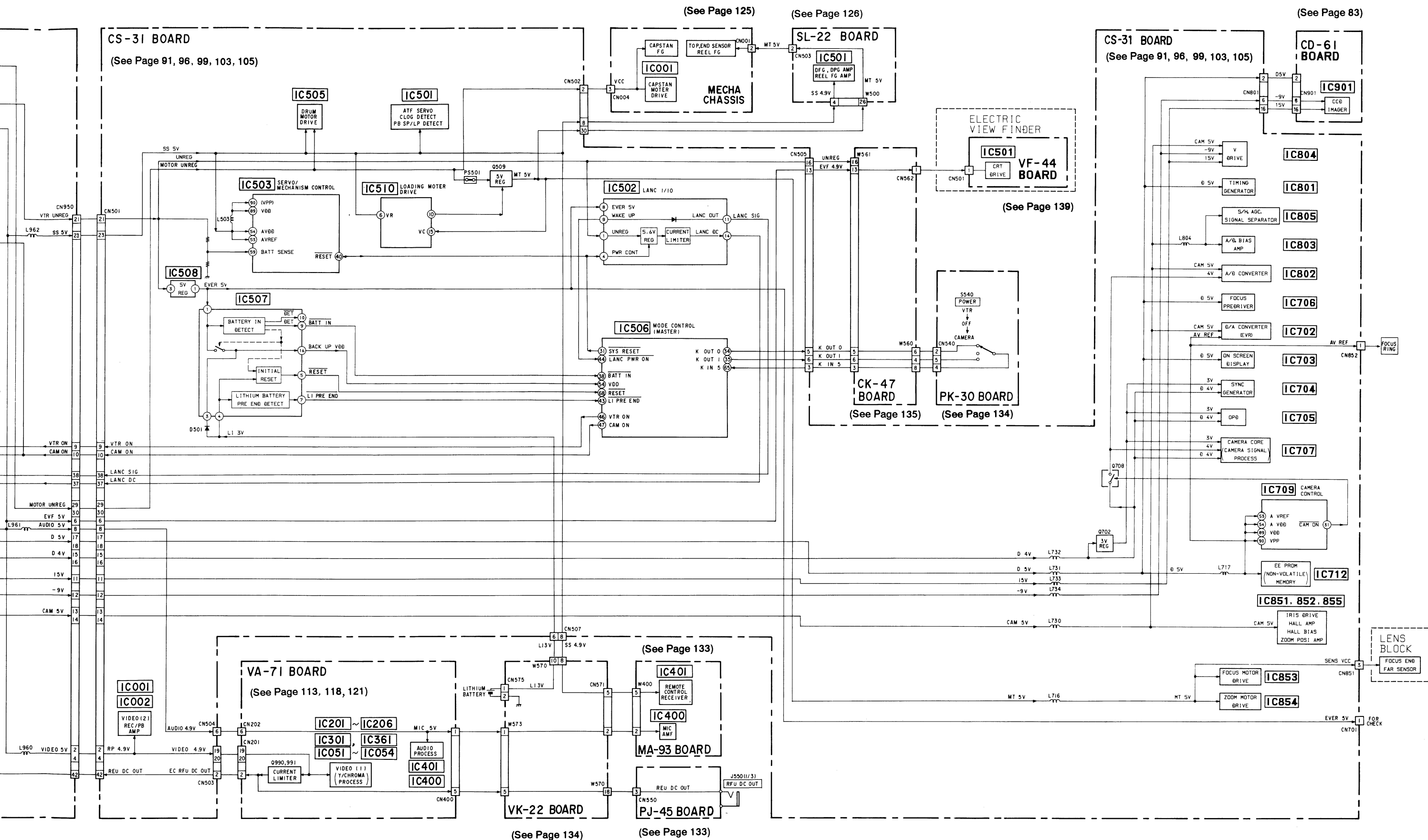


3-14. EVF BLOCK DIAGRAM



3-15. POWER BLOCK DIAGRAM

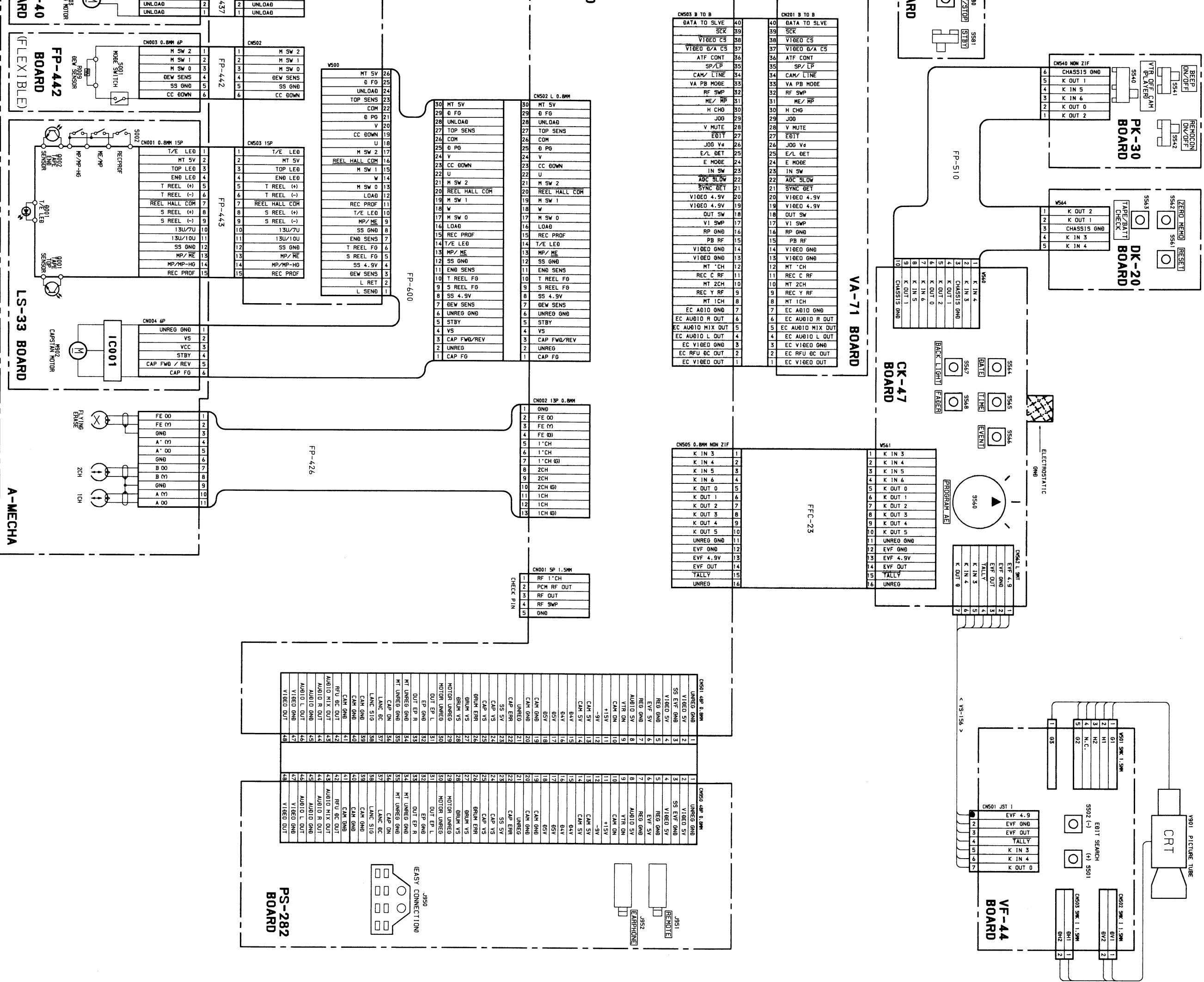




PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11





4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

• For printed wiring boards.

- : Through hole
- : Pattern from the side which enables seeing
- (The other layer's patterns are not indicated.)

* Caution:	
Pattern face side:	Parts on the pattern face side seen from (Conductor Side)
Parts face side:	Parts on the parts face side seen from the (Component side)

• For schematic diagrams.

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/16W unless otherwise noted. $k\Omega$: 1000 Ω , $M\Omega$: 1000 $k\Omega$.
- All capacitors are in μF unless otherwise noted. pF : μF , 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- : internal component.
- : adjustment for repair.*
- — : B+ Line.*
- - - - : B- Line.*
- : IN/OUT direction of (+, -) B LINE.*
- : Circled numbers refer to waveforms.*

Note:
The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.
When indicating parts by reference number, please include the board name.

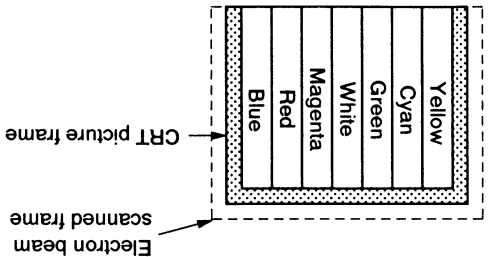


Fig. (Picture on monitor TV)

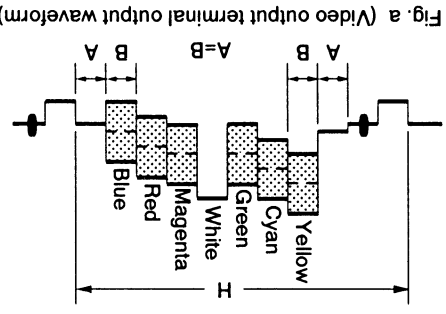
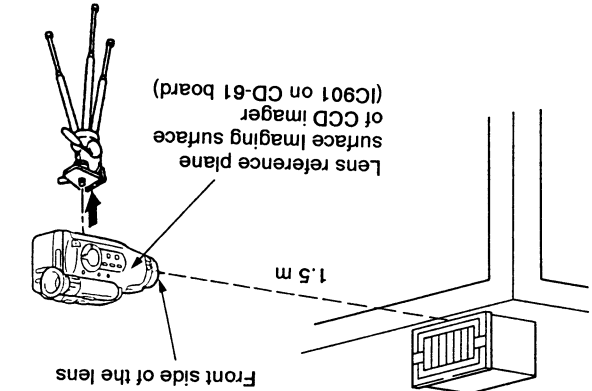


Fig. a (Video output terminal output waveform)



1. Connection

- Measuring conditions voltage value and waveform. (CAMERA, DIGITAL TITLE block)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
- Readings are taken with a digital multimeter (DC 10M Ω).*
- Voltage variations may be noted due to normal production tolerances.*

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

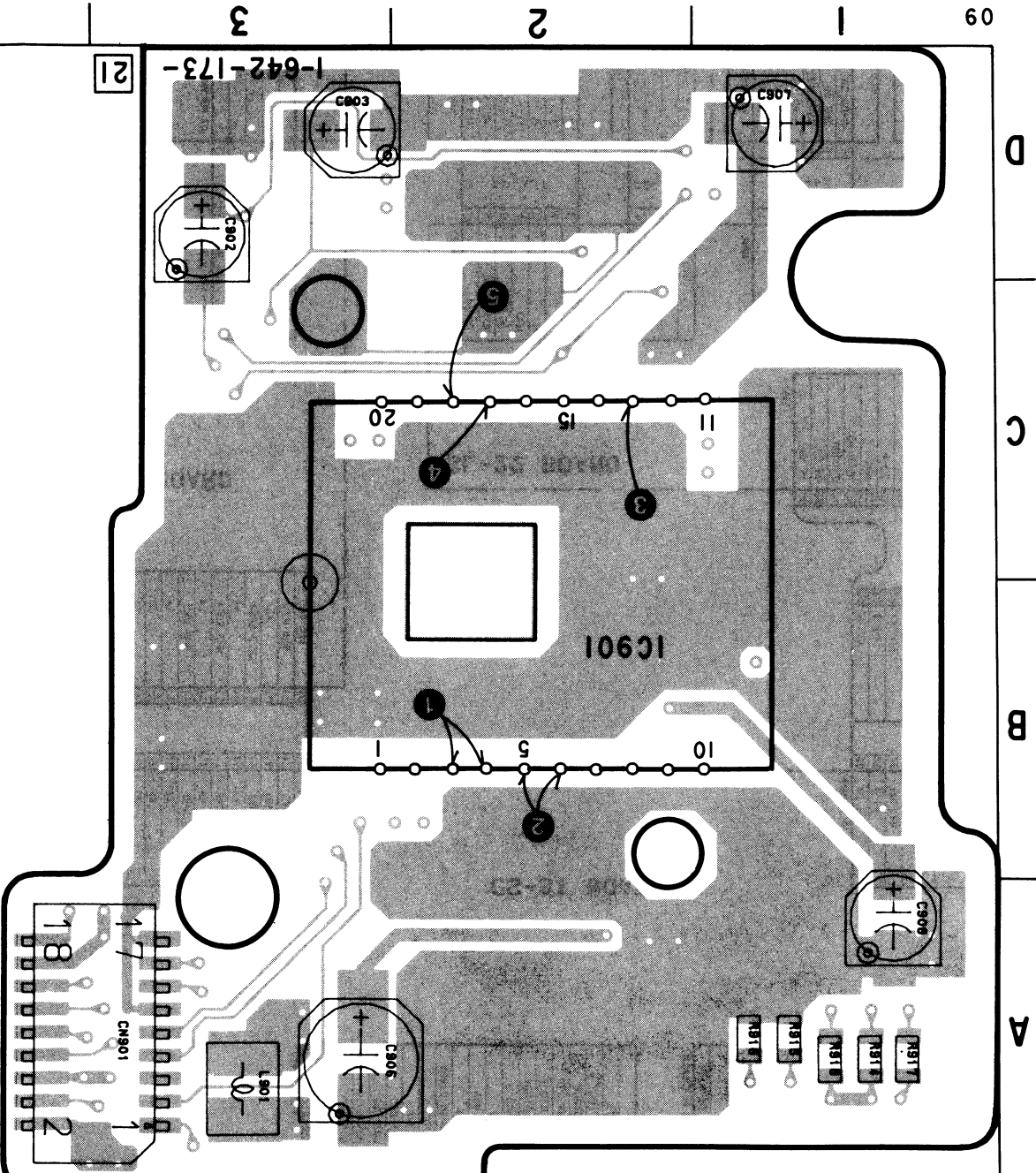
(VIDEO, SERVO/SYSTEM CONTROL, VIEW FINDER block)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10M Ω).*
- Voltage variations may be noted due to normal production tolerances.*
- *: indicated by the color red.

CD-61 (CCD DRIVE) PRINTED WIRING BOARD

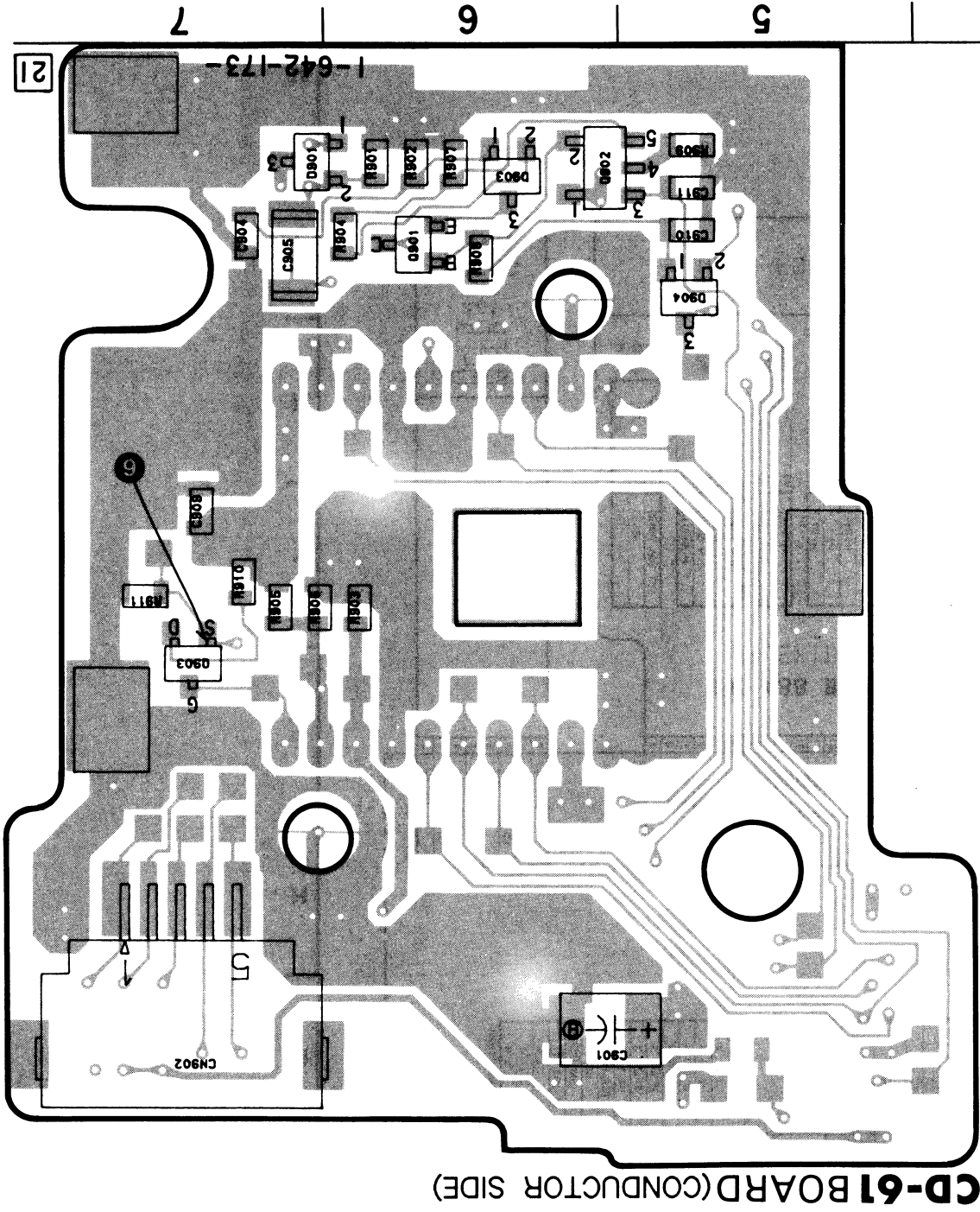
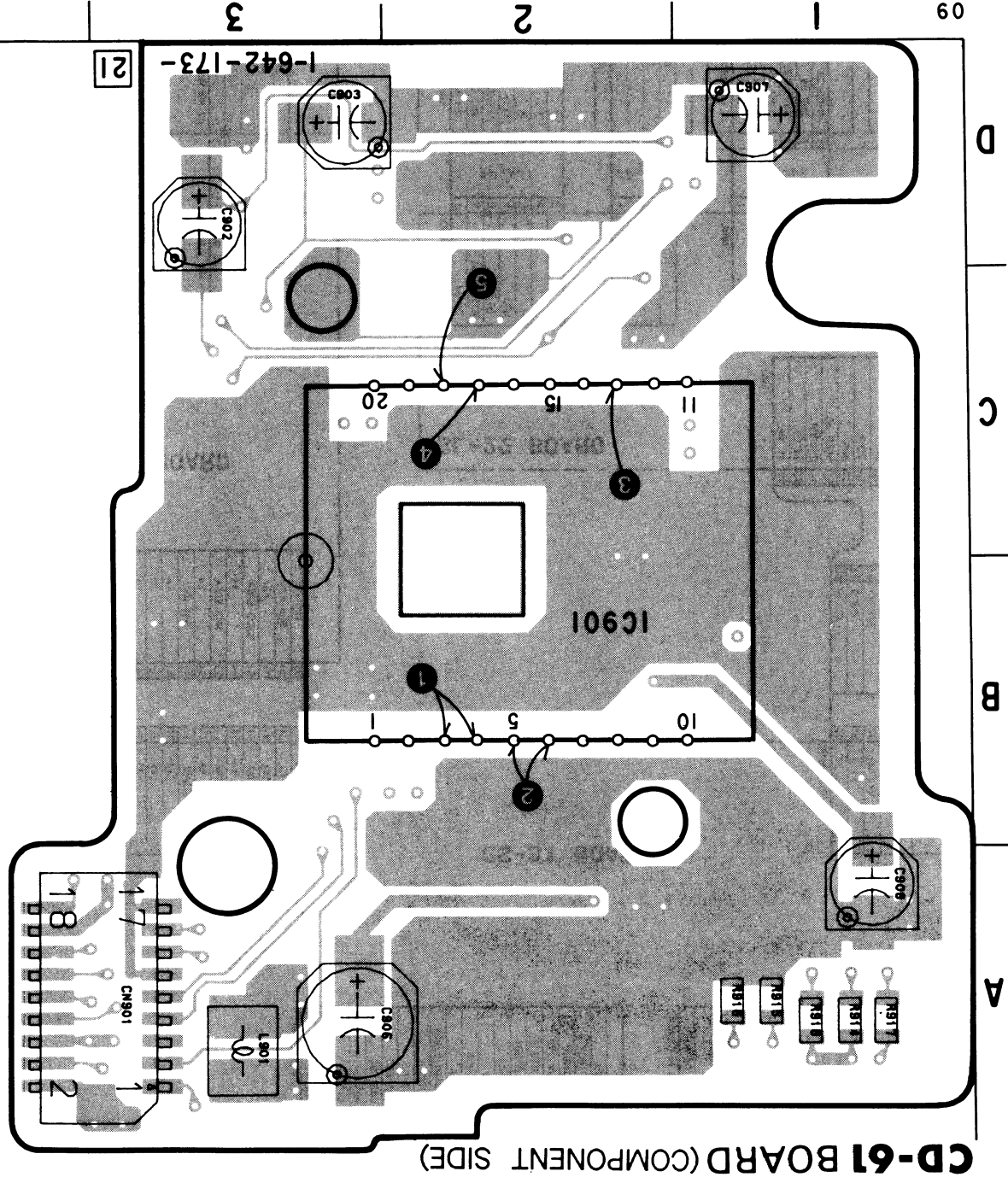
— Ref. No. CD-61 BOARD: 1000 series —

CD-61 BOARD (COMPONENT SIDE)



(DIODE)

- D901 8-719-820-05 DIODE 1SS181
- D902 8-729-402-13 TRANSISTOR 2SC4154-F
- D903 8-729-232-86 TRANSISTOR 2SK1875

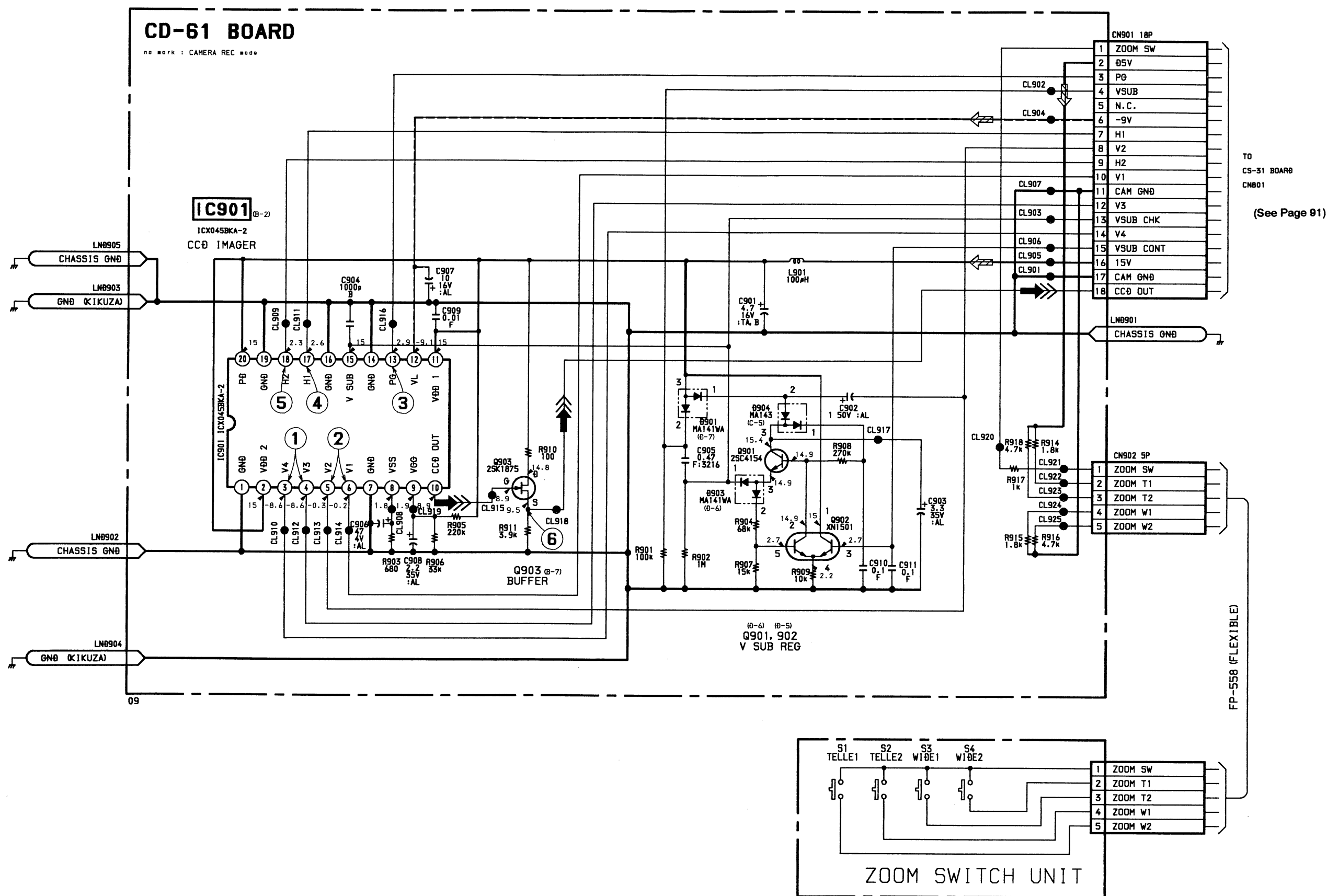


D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226
Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875

< DIODE >
< TRANSISTOR >

CD-61 (CCD DRIVE) SCHEMATIC DIAGRAM

— Ref. No. CD-61 BOARD: 1000 series —

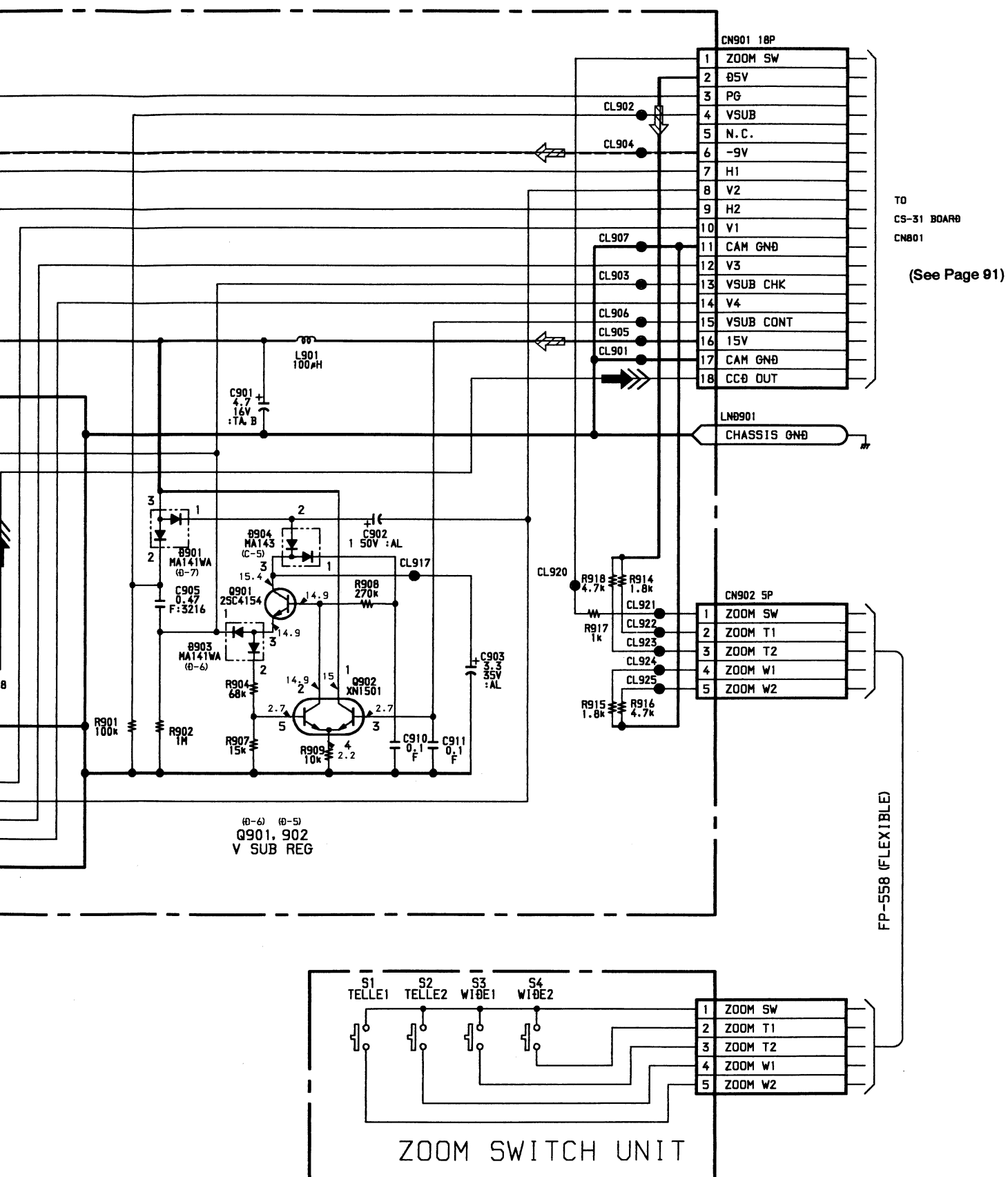


Note on the CC

- Some of this imager (IC901) The correction of the camera also written on (upper) of the The correction supplied for imager to which data label and the camera mic for input meth
- The CCD ima CD-61 board su When replacin from the old bo
- Perform all ad imager has bee
- Handle the CC may be broken Also, prevent and strong ligh

• SIGNAL PAT

	CHRO
REC	
PB	



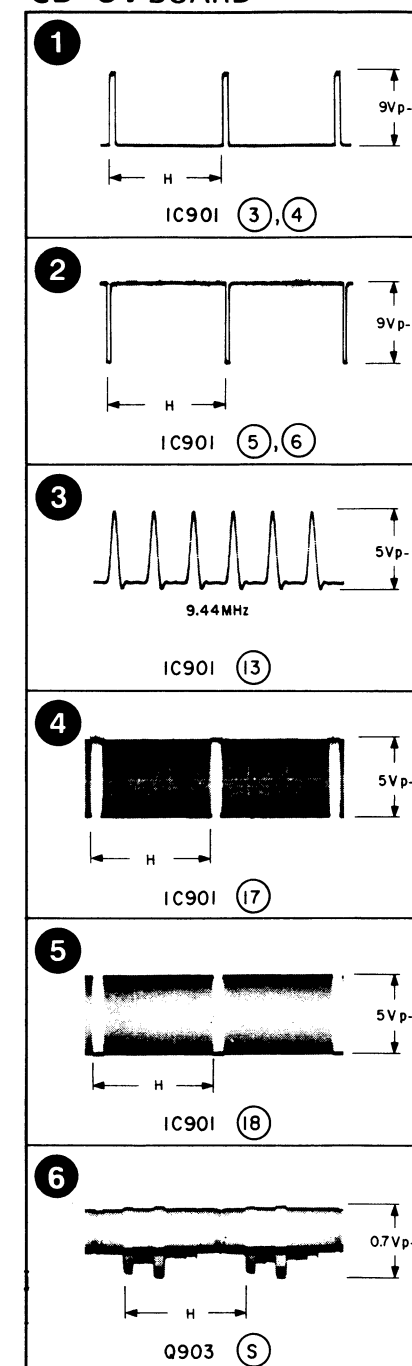
Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-61 board), some do not. The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on CS-31 board), and also written on the CCD data label put on the shield case (upper) of the PS-282 board. The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-61 board supplied as the repair parts. When replacing the CD-61 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure. Also, prevent the receiving light section from dust attached and strong light.

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡➡➡	
PB				

CD-61 BOARD



< DIODE >

AD501	8-719-421-27 DIODE	MA728
D502	8-719-404-46 DIODE	MA110
D503	8-719-977-34 DIODE	DTZ12
D504	8-719-941-86 DIODE	DAN202U
D505	8-719-422-07 DIODE	MA8082
D506	8-719-422-07 DIODE	MA8082
D507	8-719-404-46 DIODE	MA110

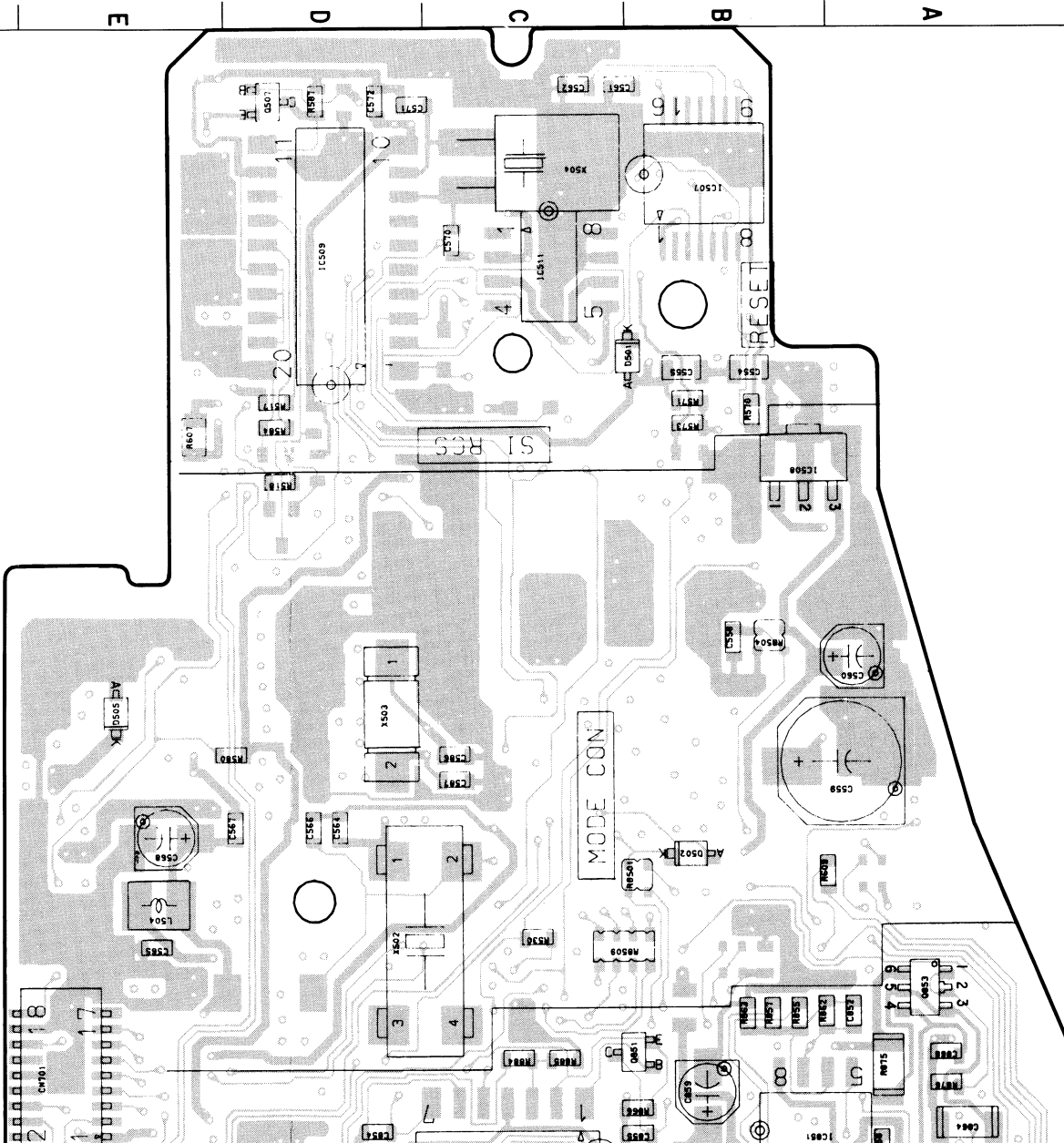
< IC >

IC001	8-752-058-14 IC	CXA1202R
IC501	8-759-058-96 IC	TB1206F
IC502	8-759-999-02 IC	TL1596CDB
IC503	8-752-838-46 IC	CXP80624-410Q
IC505	8-759-990-55 IC	CXA8006M
IC506	8-759-088-92 IC	uPD75316GF-303-3B9
IC507	8-759-511-22 IC	CXA1448N
IC508	8-759-512-69 IC	S-81350HG-KD
IC509	8-759-145-63 IC	uPD7564G-540
IC510	8-759-039-01 IC	MP1720M
IC511	8-759-044-78 IC	AK6420F
IC701	8-759-031-58 IC	SC7SU04F
IC702	8-759-635-27 IC	M62352GP
IC703	8-759-069-29 IC	uPD6456GS-618
IC704	8-752-348-92 IC	CXD2101AR
IC705	8-759-063-18 IC	CXD2103AR
IC706	8-752-337-36 IC	CXD2104N
IC707	8-752-337-32 IC	CXD2100Q
IC709	8-752-837-59 IC	CXP80624-299Q
IC712	8-759-044-78 IC	AK6420F
IC801	8-752-337-34 IC	CXD1257R
IC802	8-752-056-39 IC	CXA1507BR
IC803	8-752-053-26 IC	CXA1399Q
IC804	8-752-327-48 IC	CXD1250N
IC805	8-752-054-61 IC	CXA1390AR
IC851	8-759-981-82 IC	RC3414M
IC852	8-759-998-96 IC	LM324D
IC853	8-759-038-81 IC	MP1724M
IC854	8-759-823-51 IC	LB1830M
IC855	8-759-998-96 IC	LM358D

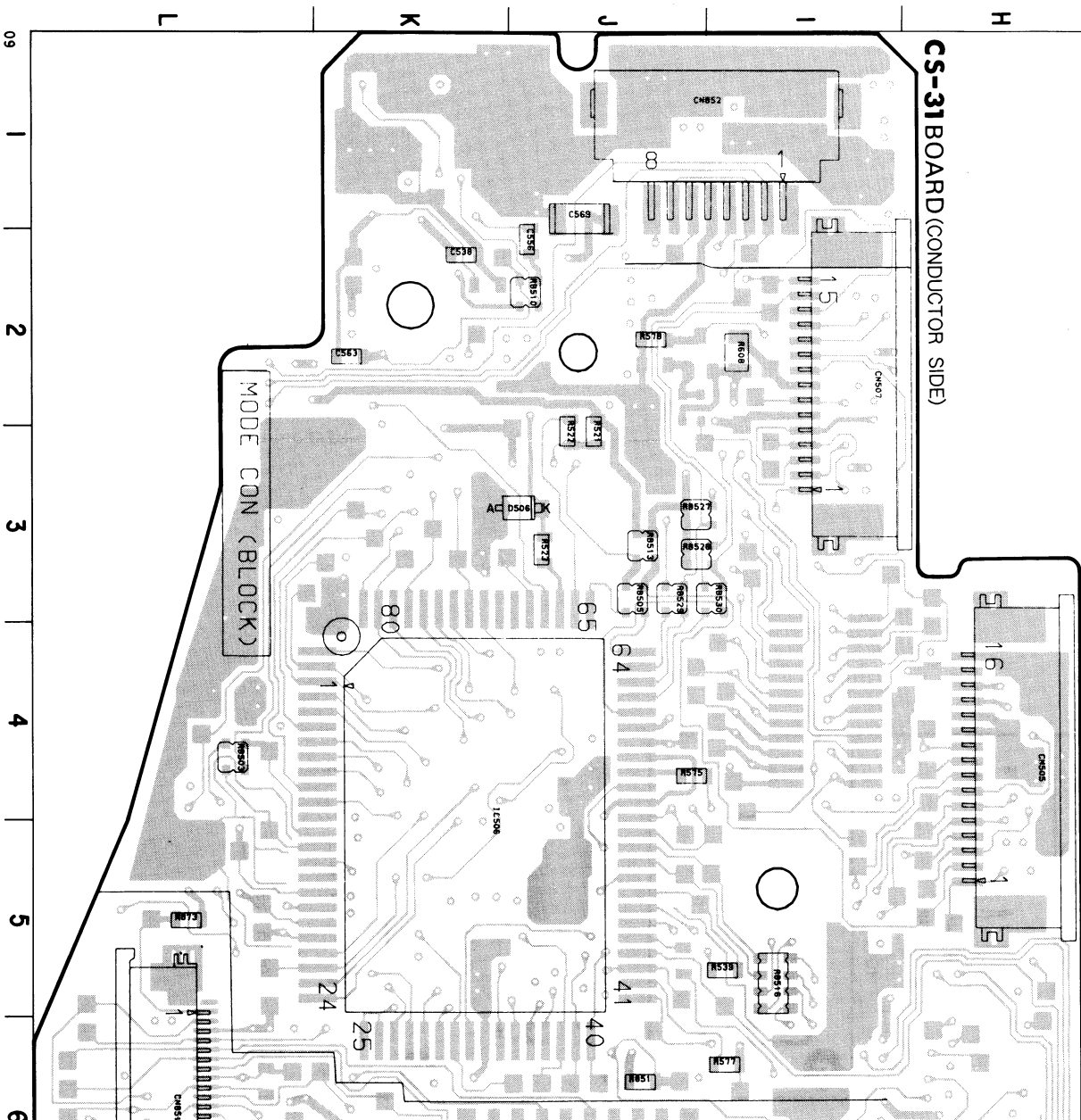
< TRANSISTOR >

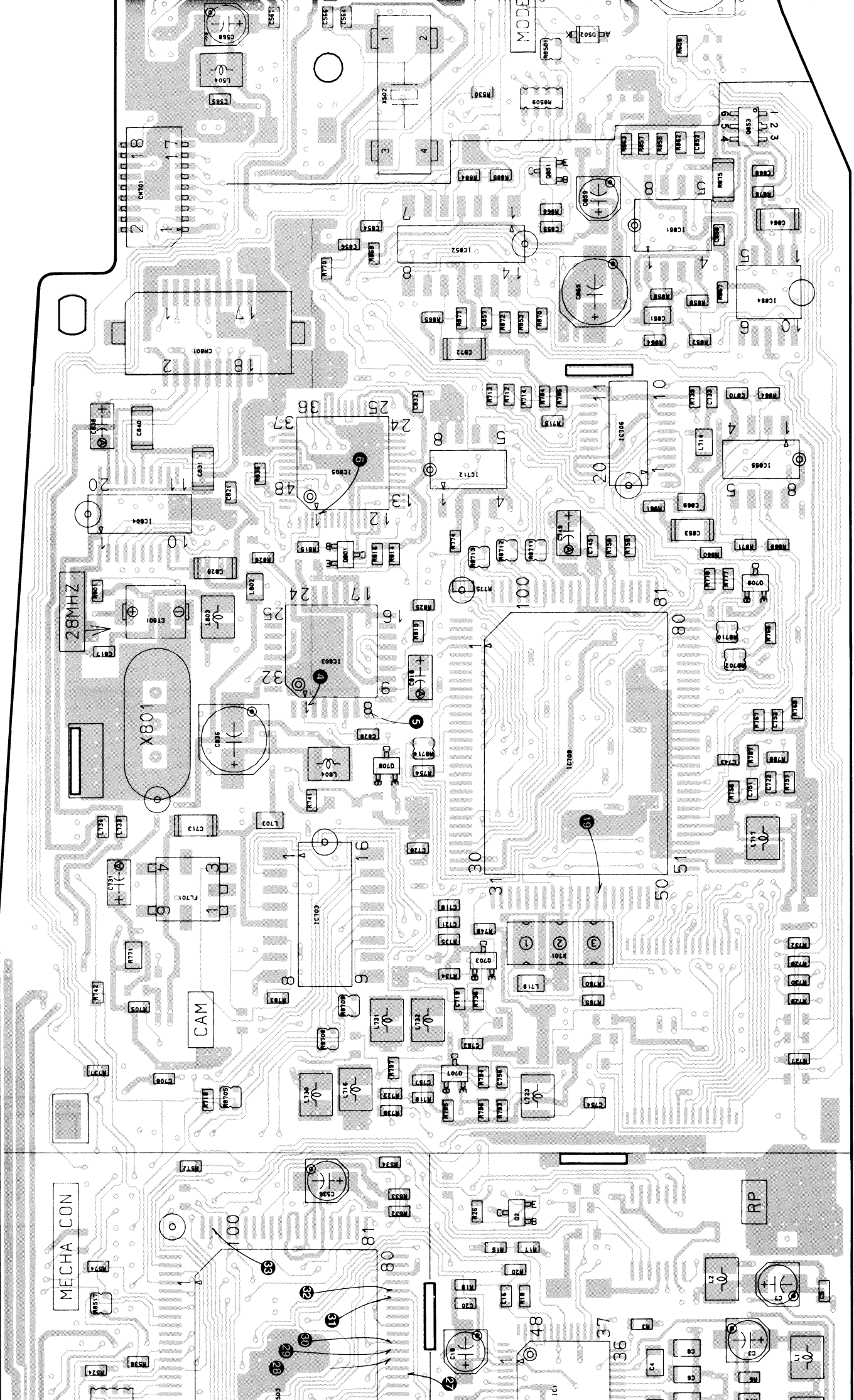
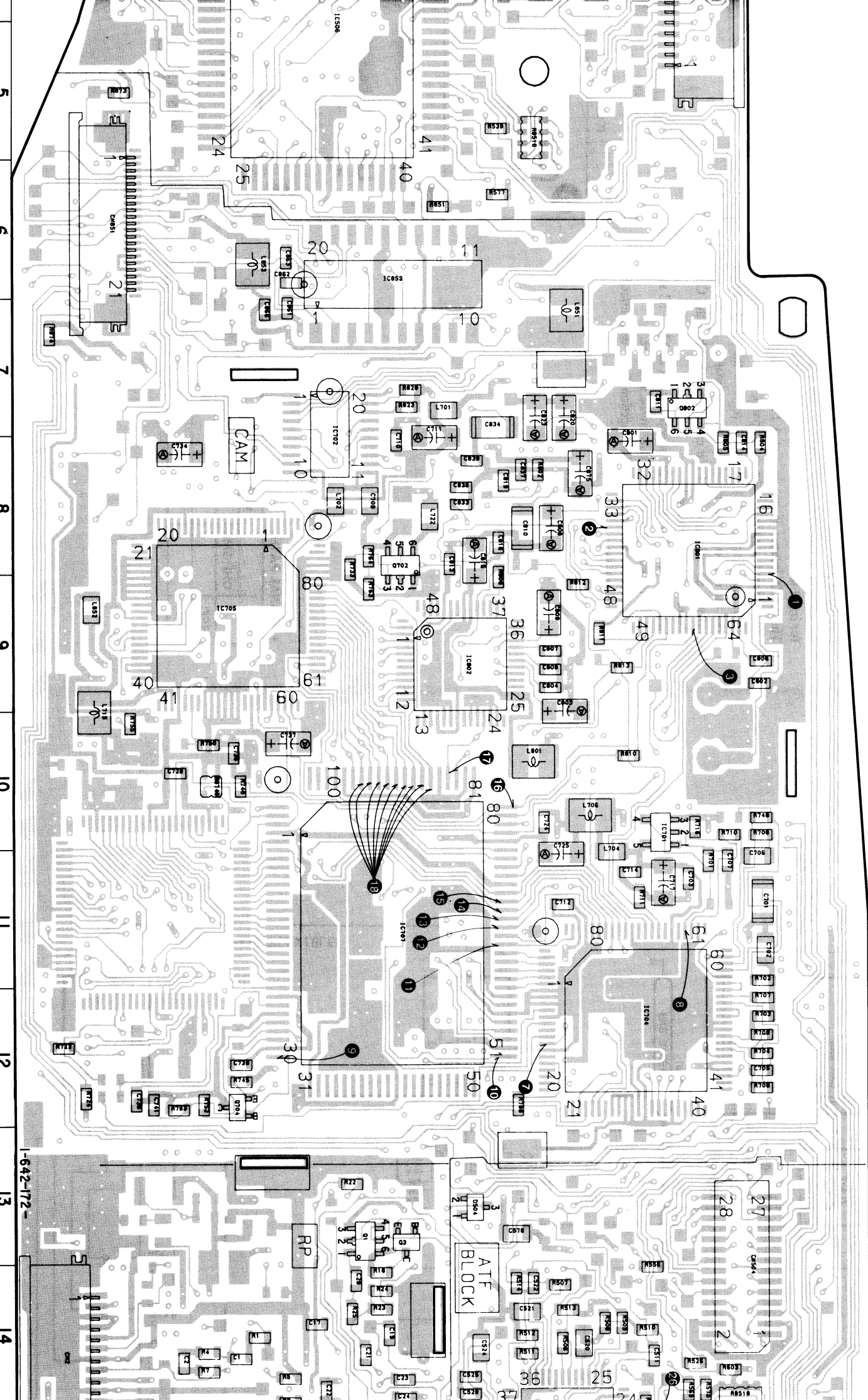
0001	8-729-420-20 TRANSISTOR	XN4312
0002	8-729-120-28 TRANSISTOR	2SC1623-LSL6
0003	8-729-905-12 TRANSISTOR	DTA144EU
0041	8-729-905-23 TRANSISTOR	2SA1576-R
0043	8-729-216-22 TRANSISTOR	2SA1162-G
0501	8-729-907-00 TRANSISTOR	DTC114EU
0502	8-729-402-78 TRANSISTOR	XN6401
0503	8-729-120-28 TRANSISTOR	2SC1623-LSL6
0507	8-729-905-12 TRANSISTOR	DTA144EU
0509	8-729-822-84 TRANSISTOR	2SB1202FAST
0510	8-729-402-81 TRANSISTOR	XN4501
0511	8-729-402-81 TRANSISTOR	XN4501
0702	8-729-402-84 TRANSISTOR	XN4601
0703	8-729-010-60 TRANSISTOR	MSA1586-BC
0704	8-729-010-60 TRANSISTOR	MSA1586-BC
0707	8-729-010-75 TRANSISTOR	MSCA116-B/C
0708	8-729-920-XX TRANSISTOR	DTA114EU
0709	8-729-905-61 TRANSISTOR	DTC124EU
0801	8-729-423-52 TRANSISTOR	2SC3931-C
0802	8-729-403-27 TRANSISTOR	XN4401
0851	8-729-010-75 TRANSISTOR	MSCA116-B/C
0853	8-729-403-27 TRANSISTOR	XN4401

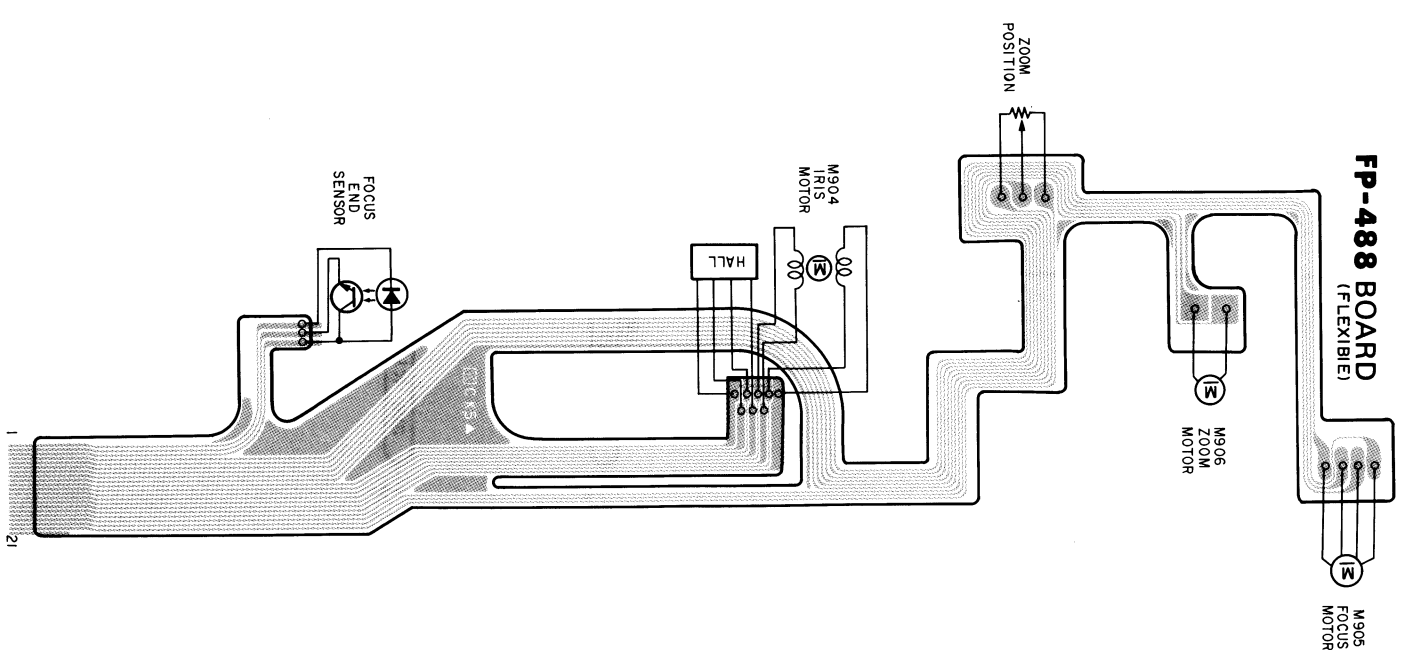
CS-31 BOARD (COMPONENT SIDE)



CS-31 BOARD (CONDUCTOR SIDE)

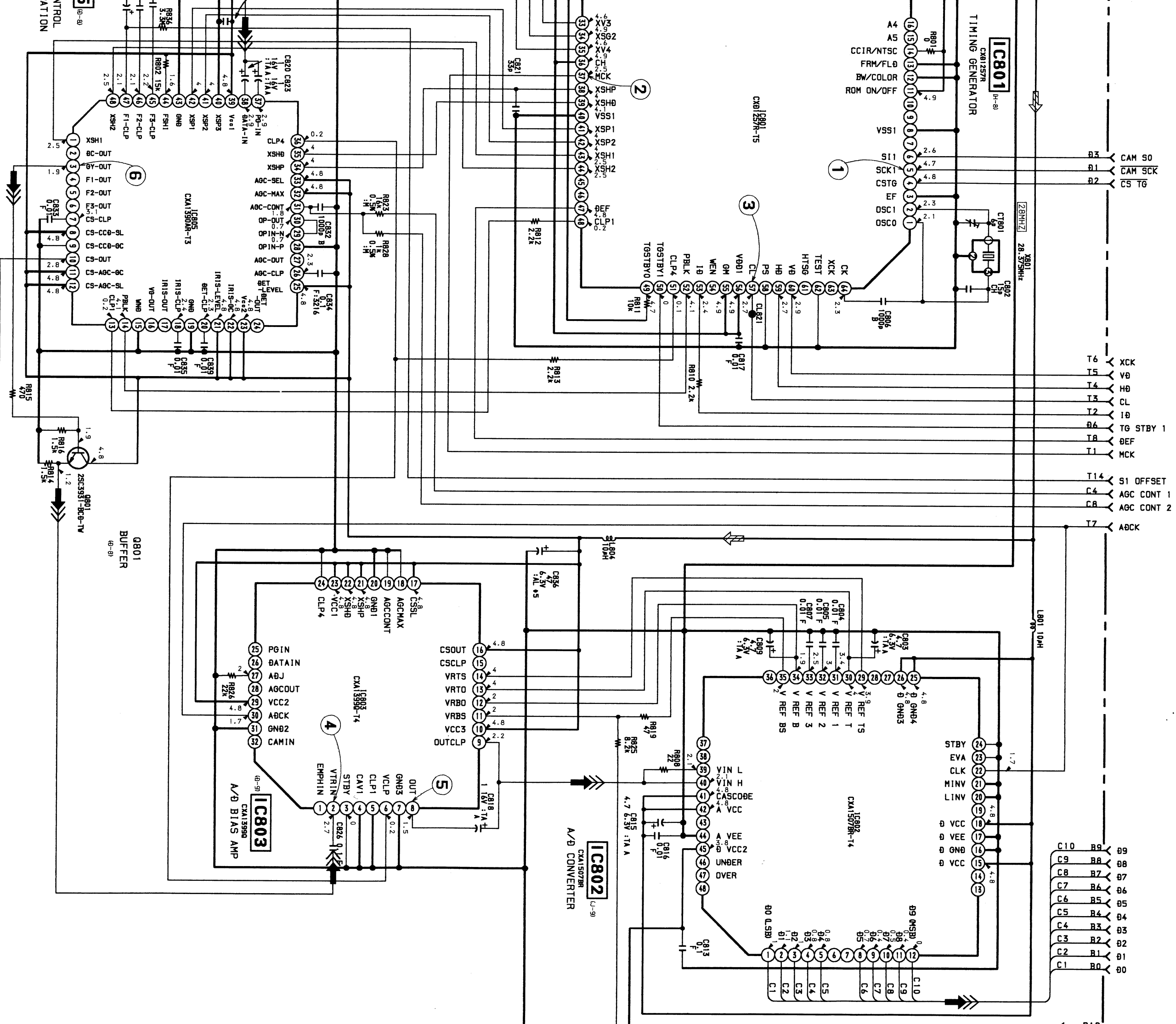






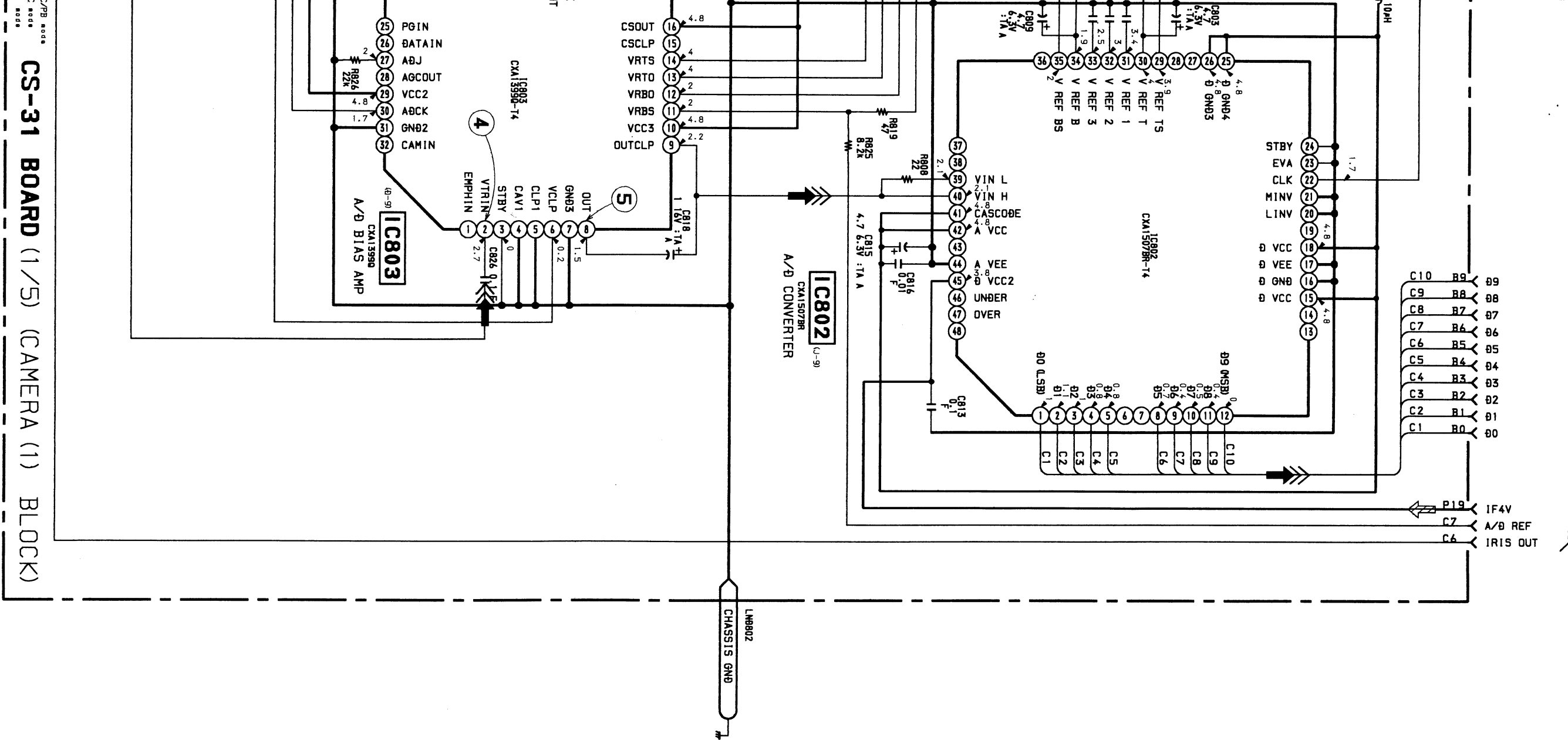
(See Page 96, 97)

TO CS-31 BOARD (2/5) CAMERA (2) BLOCK



no mark : REC/PB mode
() : REC mode
< > : PB mode

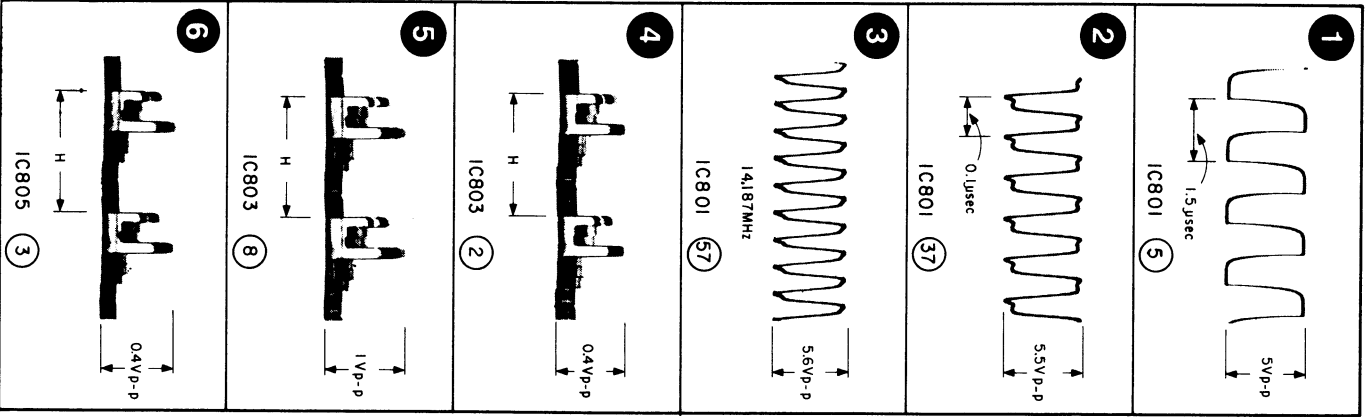
CS-31 BOARD (1/5) CAMERA (1) BLOCK



• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	
PB				

CS-31 BOARD (1/5)

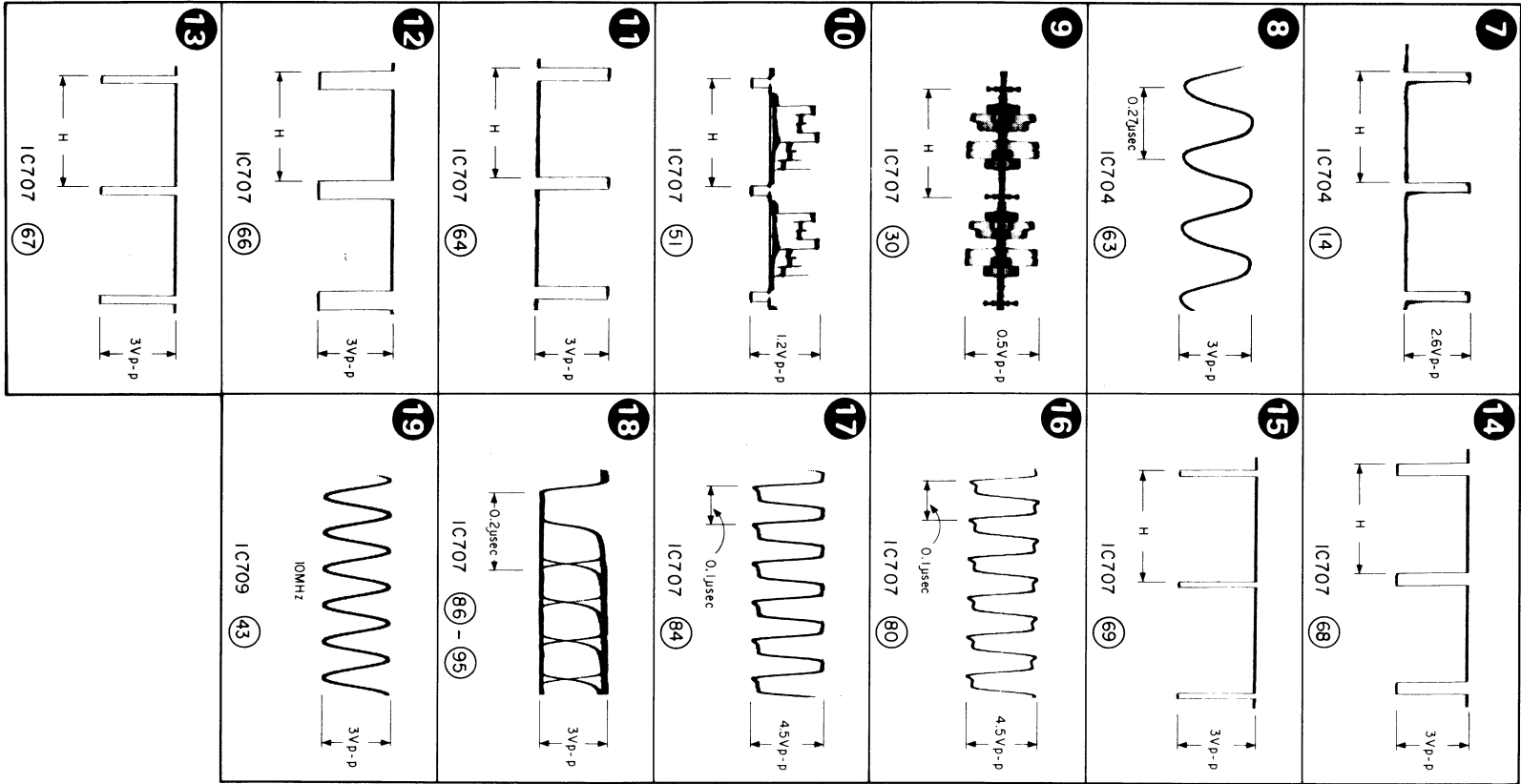


CS-31 BOARD (1/5) (CAMERA (1) BLOCK)

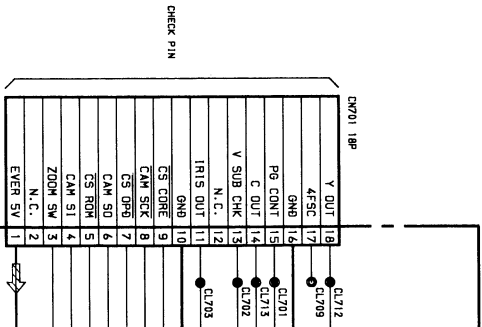
CS-31 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 87 for Printed Wiring

— Ref. No. CS-31 BOARD: 1000 series —



A B C D E F G H I J K L M N O



TO
CS-31 BOARD (G/S)
(SERVO/SYSTEM CONTROL)

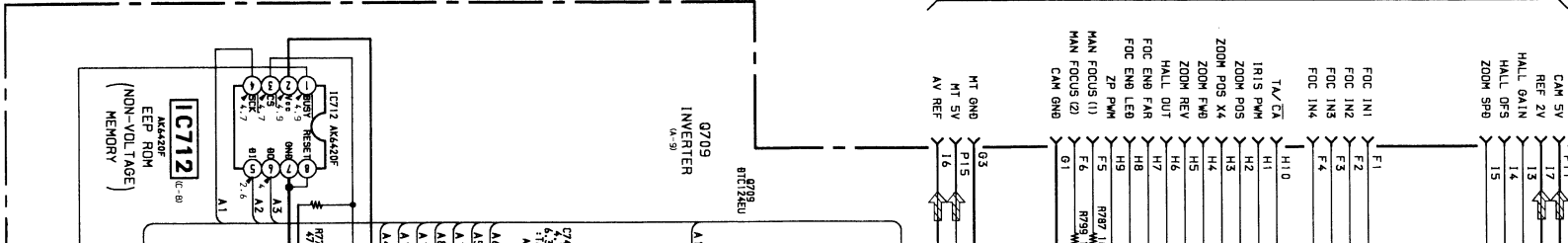
(See Page 106)

TO
CS-31 BOARD (G/S)
(CAMERA (3) BLOCK)

(See Page 101)

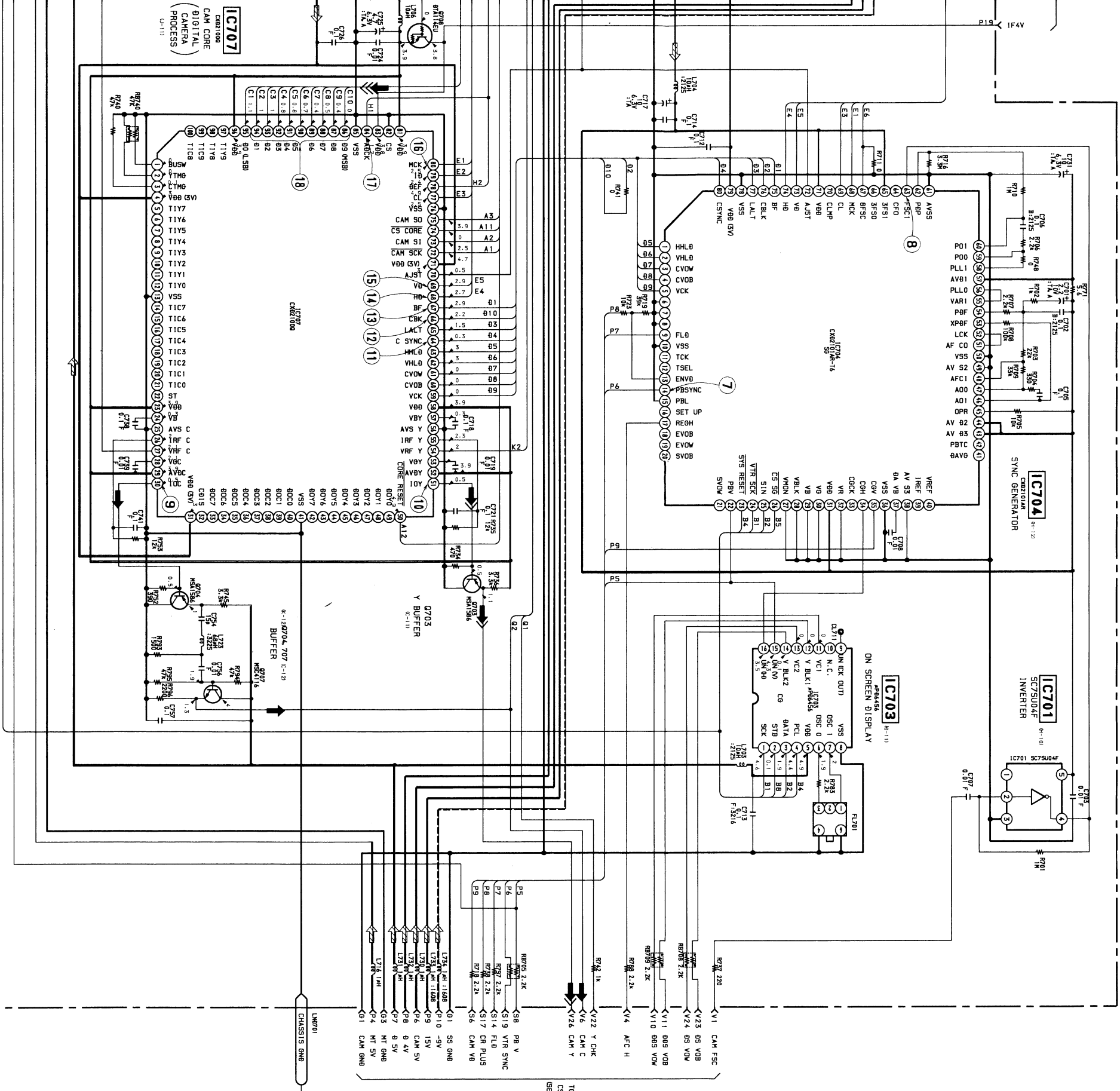
• SIGNAL PATH

	CHROMA	VIDEO SIGNAL	Y	Y/CHROMA	AUDIO SIGNAL
REC	→	→	→	→	
PB					



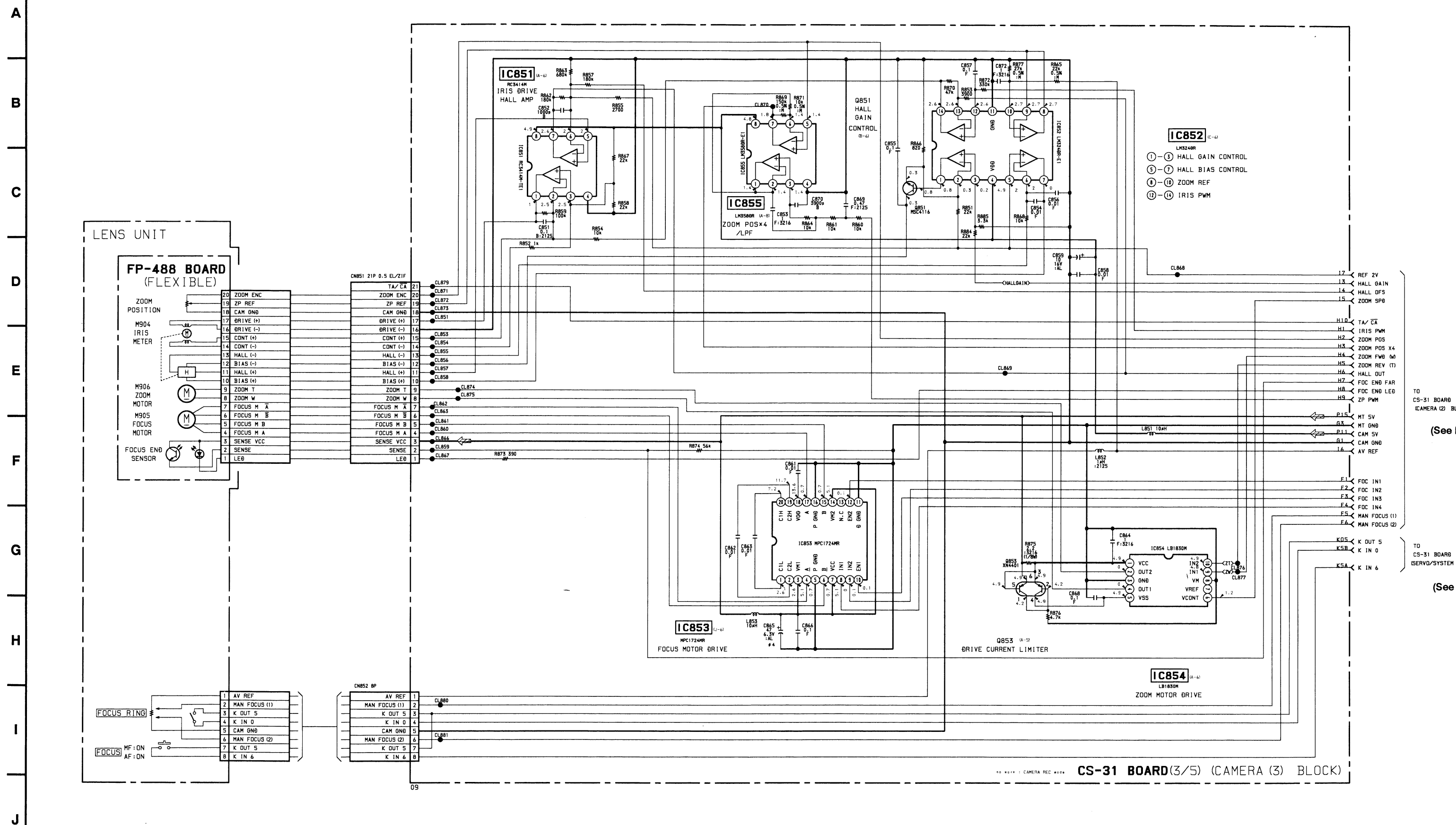
TO
CS-31 BOARD (1/5
CAMERA (1) BLOCK





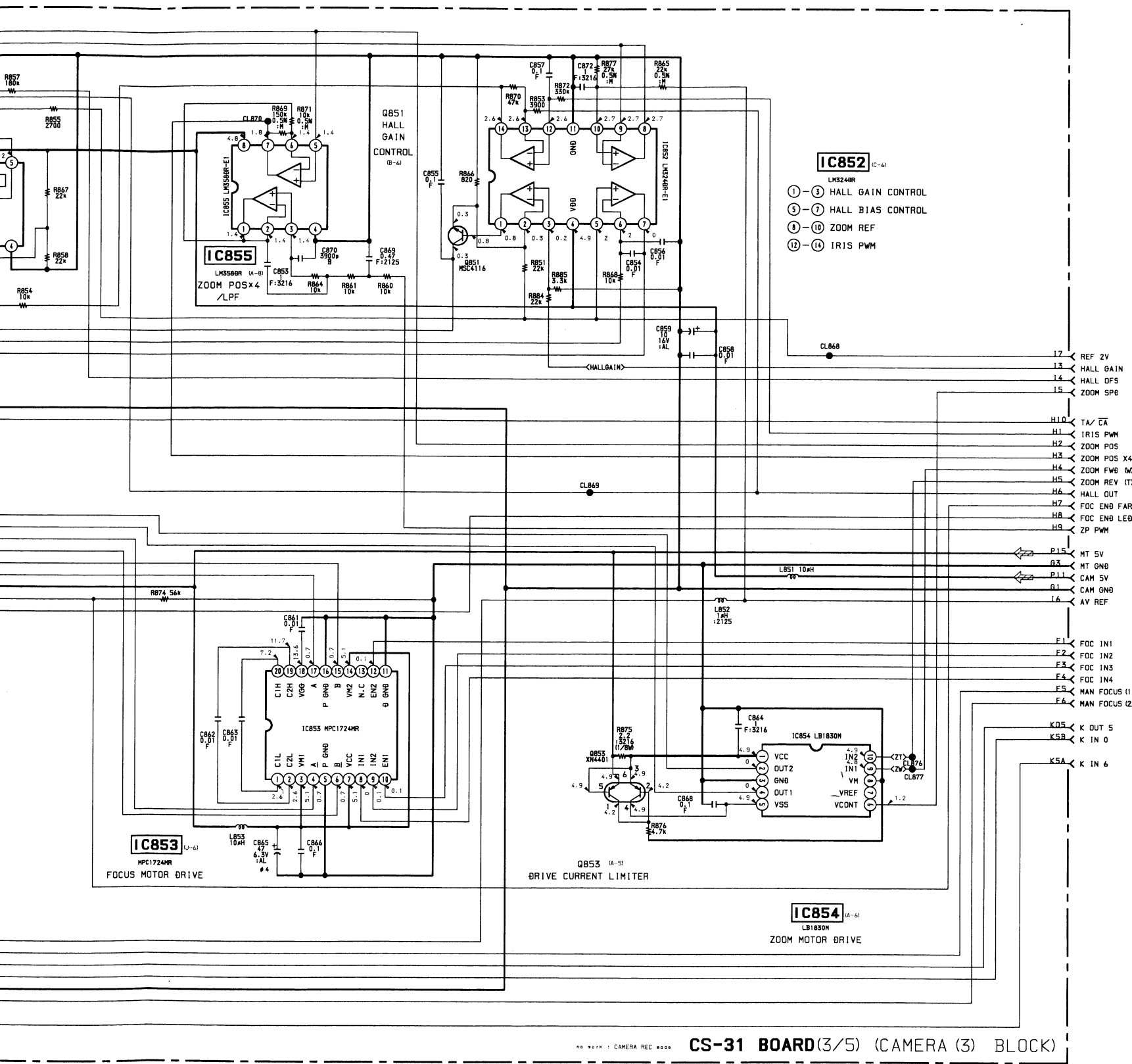
(See Page 105, 106)

— Ref. No. CS-31 BOARD: 1000 series —



87 for Printed Wiring Board.

7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----



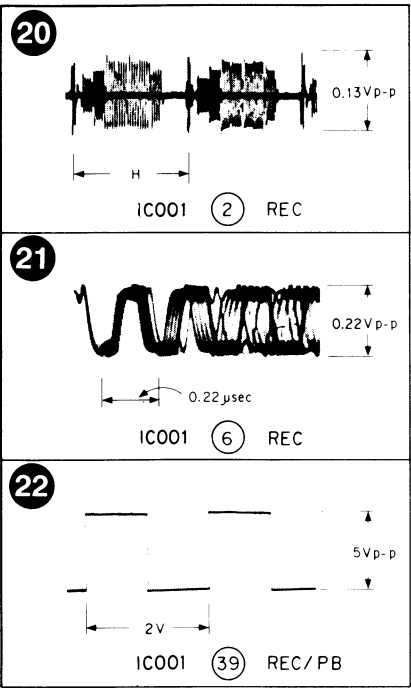
TO
CS-31 BOARD (2/5)
(CAMERA (2) BLOCK)

(See Page 96)

TO
CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

(See Page 105)

CS-31 BOARD (4/5)



• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	→	→	→	→
PB	⇒	⇒	⇒	⇒

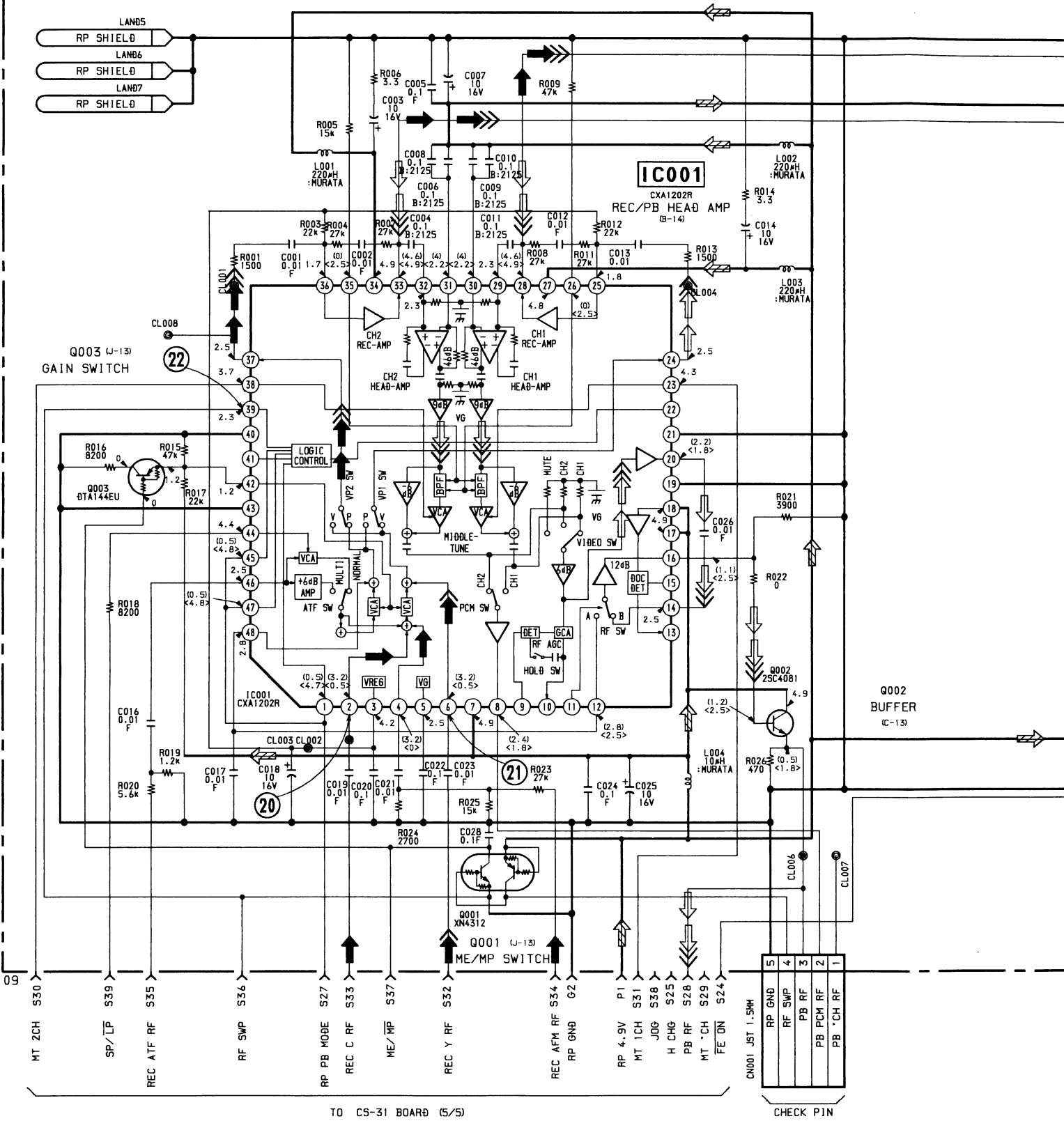
CS-31 (REC/PB AMP) SCHEMATIC DIAGRAM

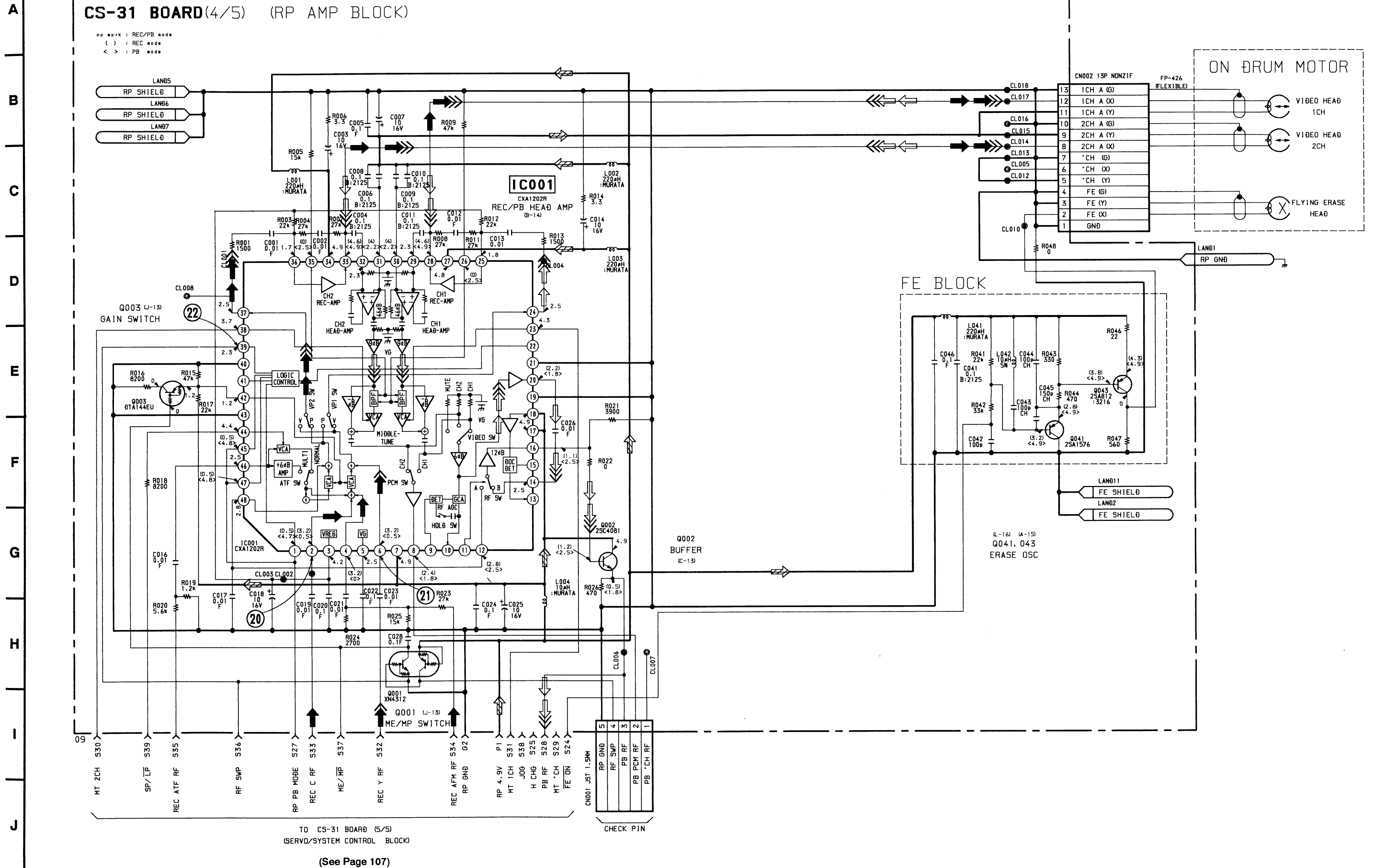
• Refer to page 87 for Printed Wiring Board.

— Ref. No. CS-31 BOARD: 1000 series —

CS-31 BOARD (4/5) (RP AMP BLOCK)

no mark : REC/PB mode
() : REC mode
< > : PB mode

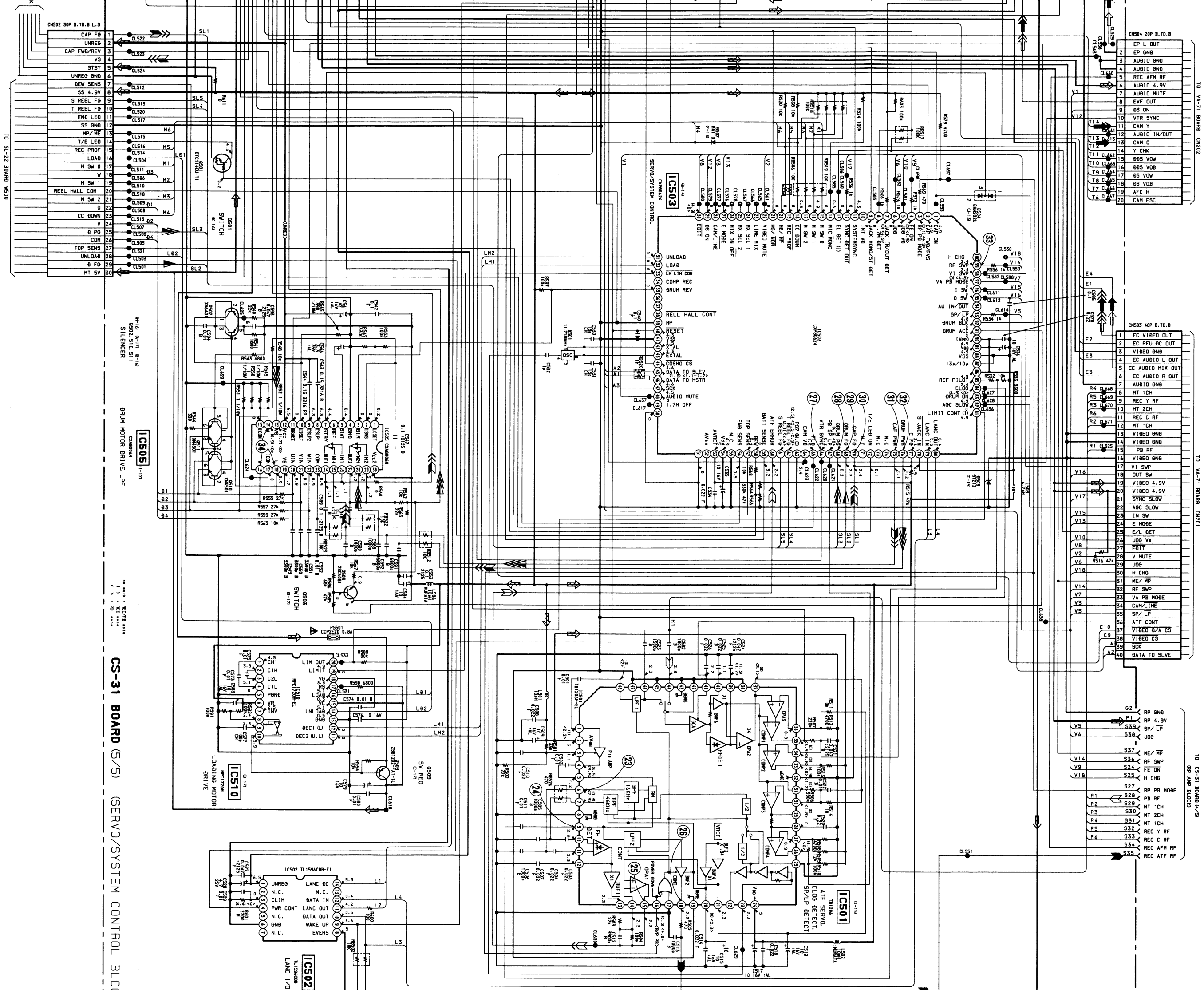




(See Page 118)

(See Page 118, 119)

(See Page 103)



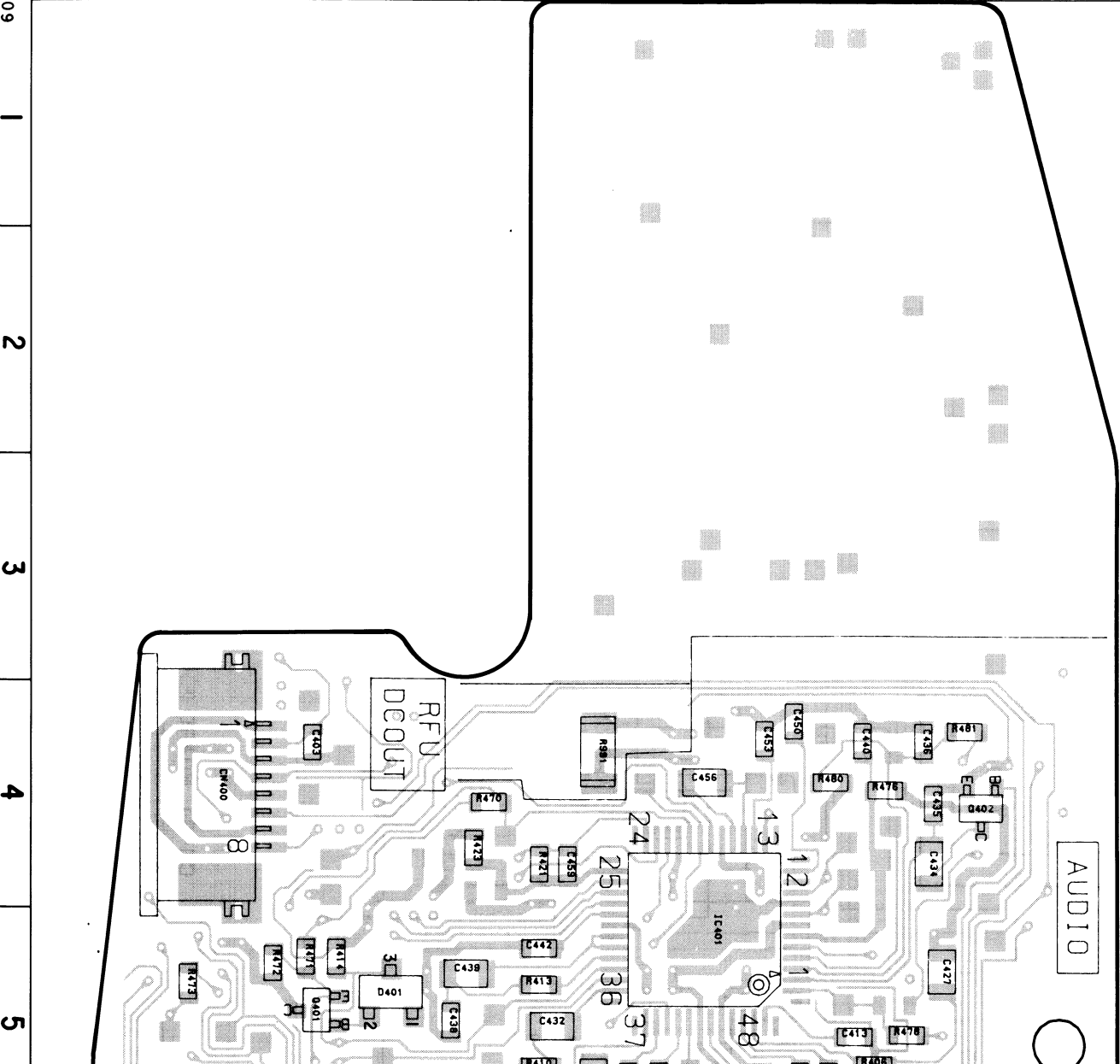
(See Page 127)

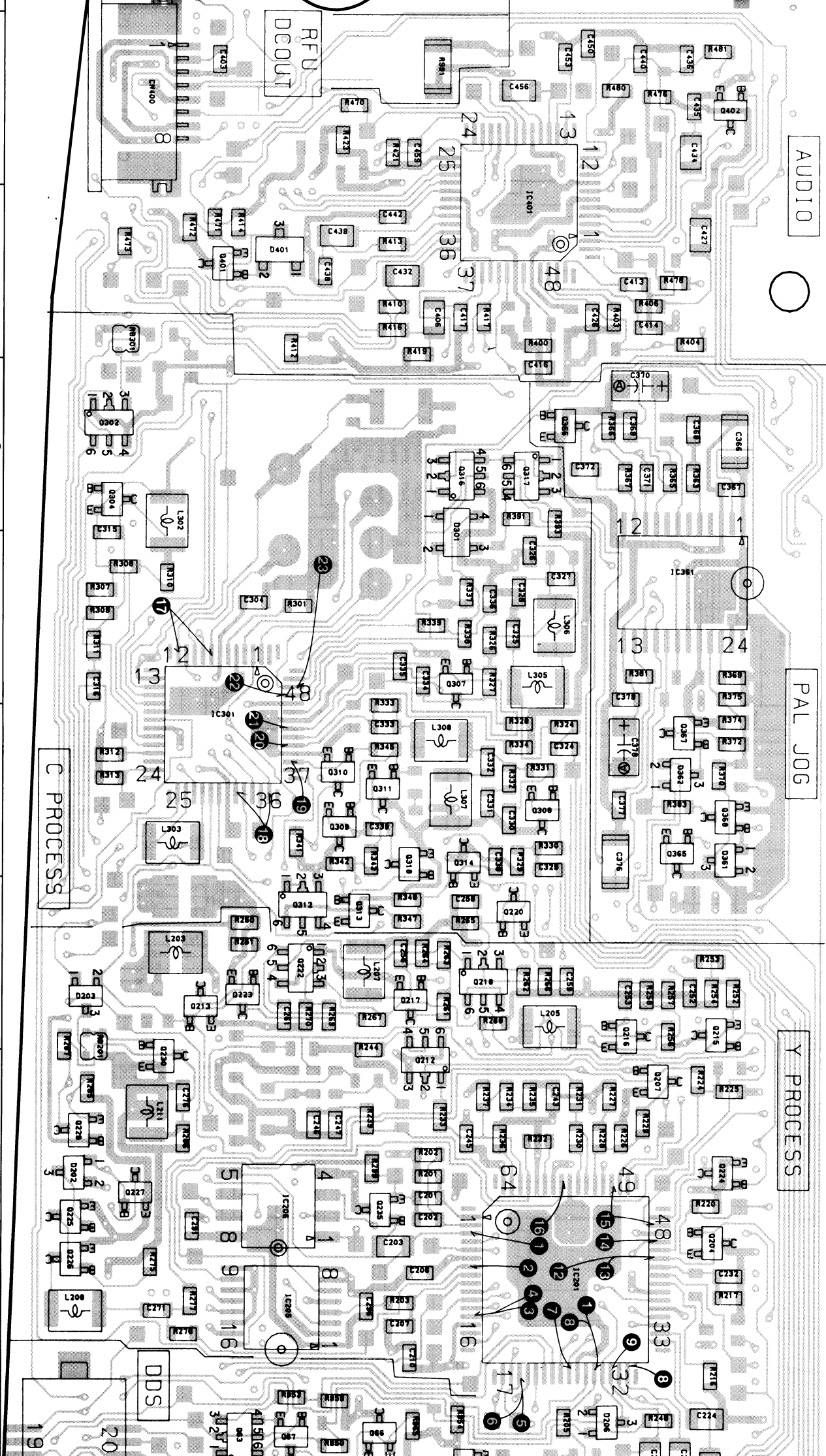
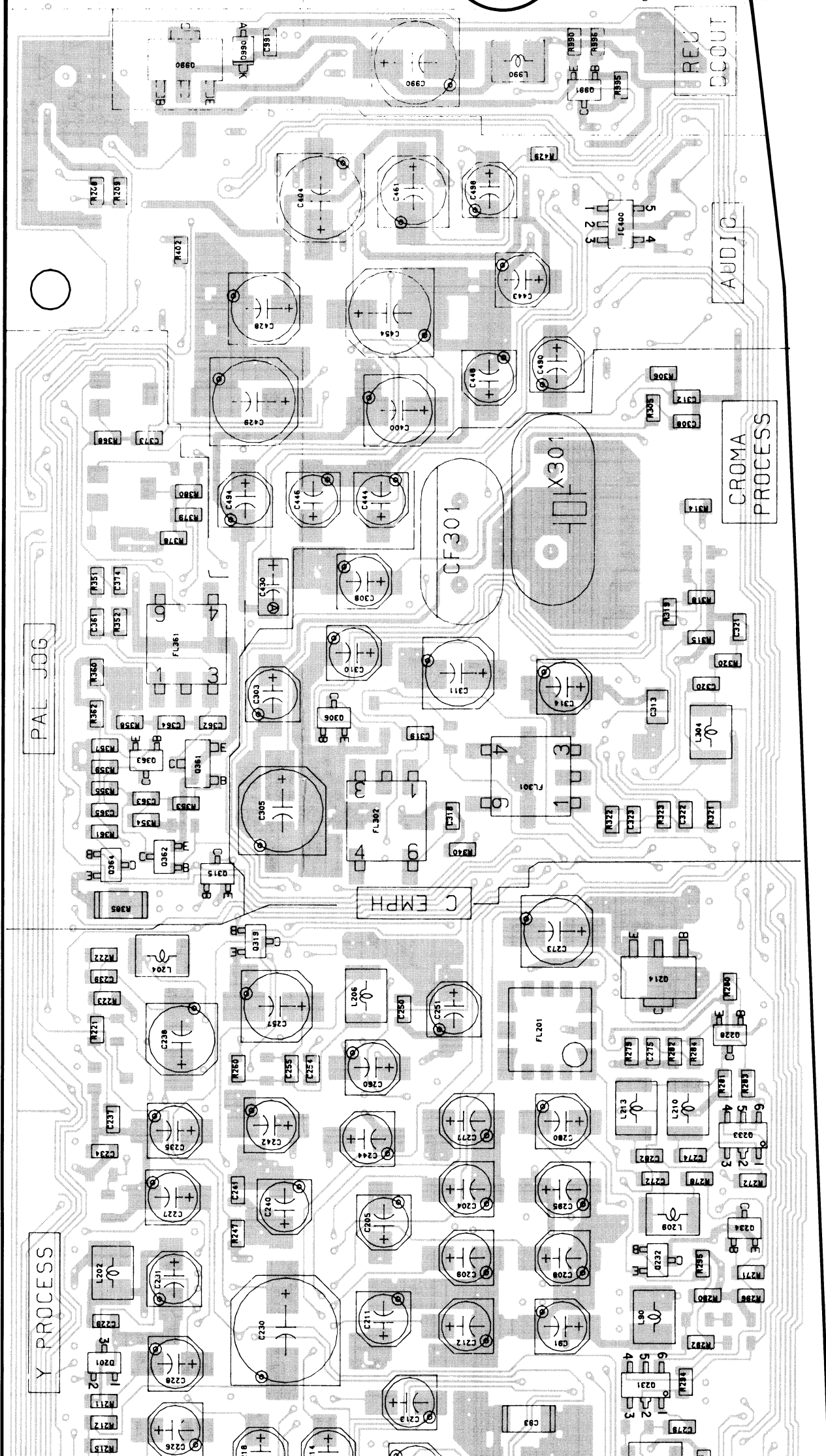
— Ref. No. VA-71 BOARD: 2000 series —

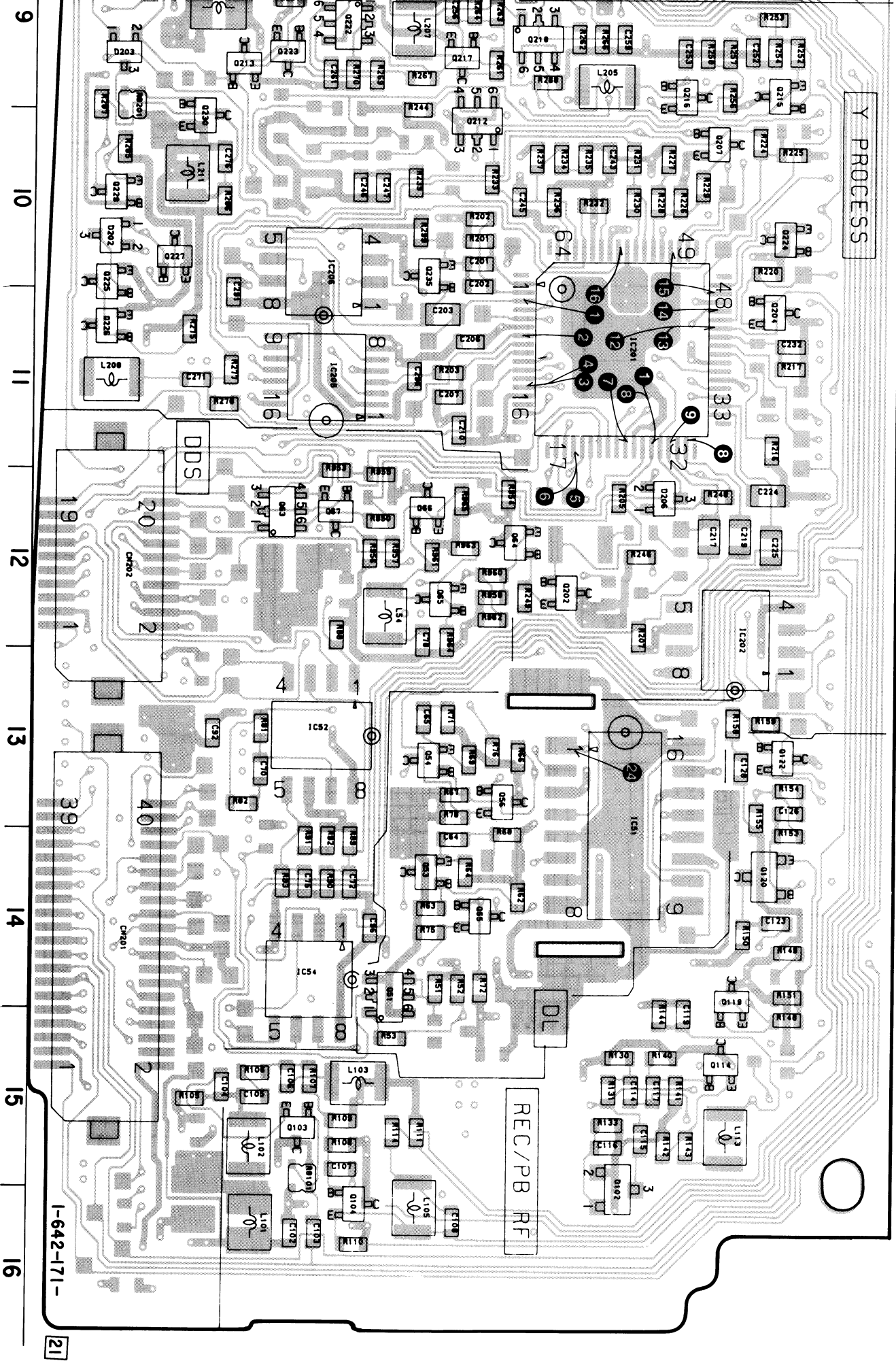
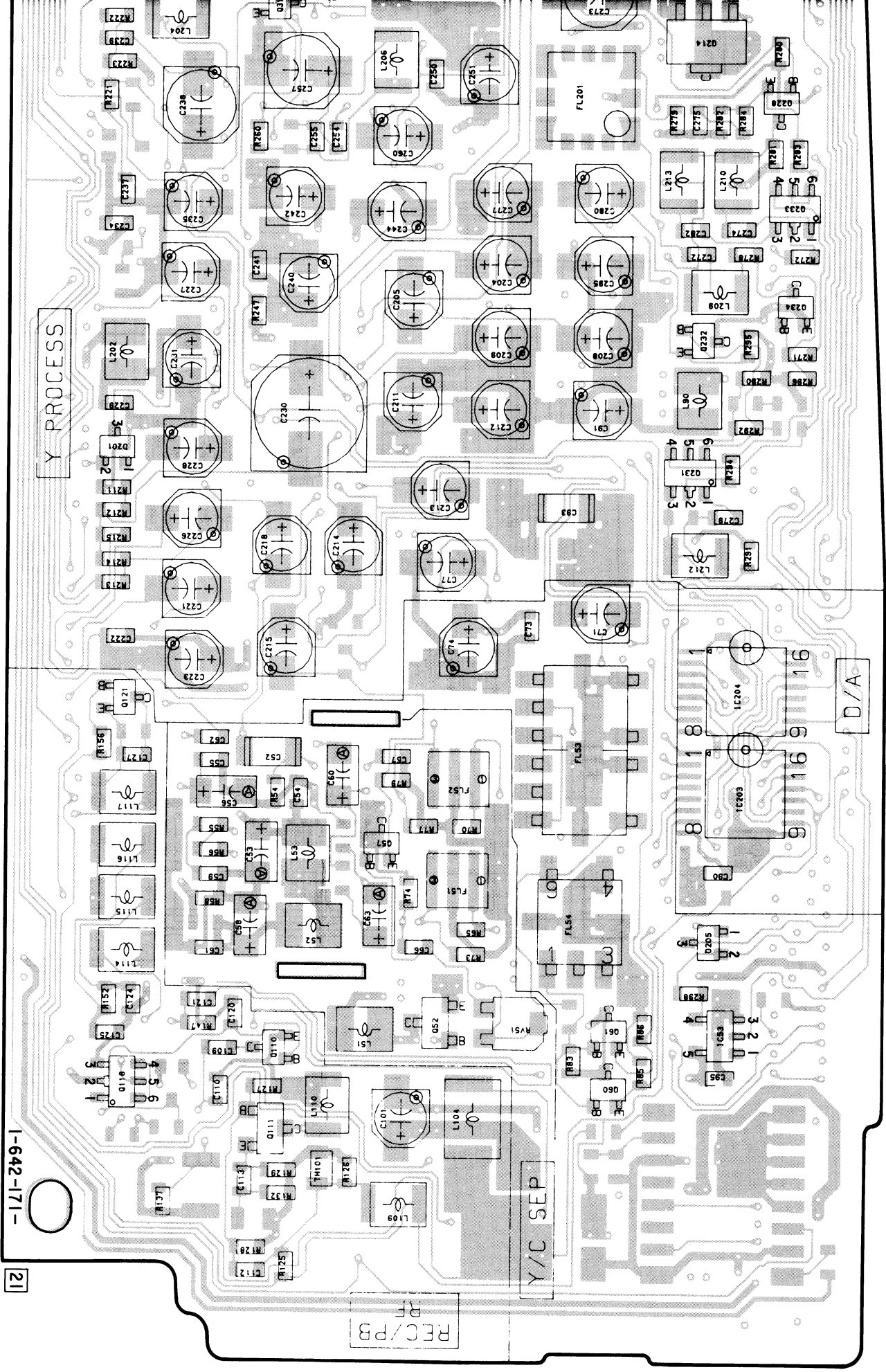
VA-71 BOARD (COMPONENT SIDE)

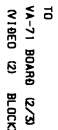


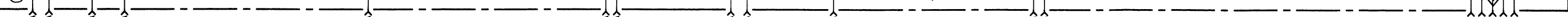
VA-71 BOARD (CONDUCTOR SIDE)











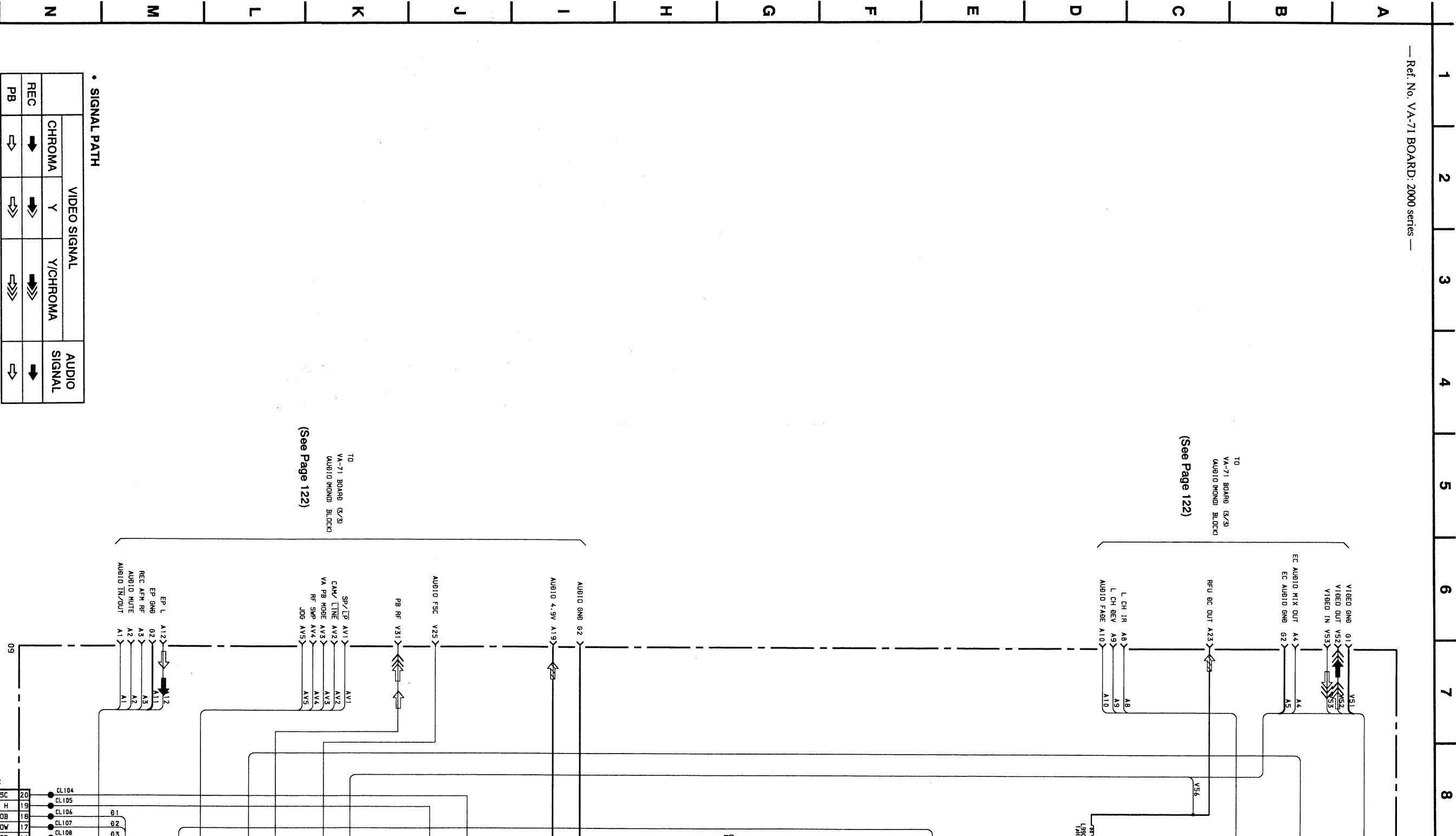


1 IC201 3 REC/PB	9 IC201 30 PB	17 IC301 8 12 REC/PB
2 IC302,201 7 REC/PB	10 IC201 38 REC	18 IC301 32 36 38 12Vp
3 IC201 13 REC	11 IC201 38 PB	19 IC301 38 PB
4 IC201 13 PB	12 IC201 43 REC	20 IC301 40 REC
5 IC201 19 PB	13 IC201 43 PB	21 IC301 42 PB
6 IC201 19 PB	14 IC201 43 PB	22 IC301 46 REC/PB
7 IC201 23 REC/PB	15 IC201 47 49 50 PB	23 IC301 47 REC/PB
8 IC201 28 32 REC	16 IC201 57 REC	

VA-71 (VIDEO) SCHEMATIC DIAGRAM

• Refer to page 109 for Printed Wiring Board.

— Ref. No. VA-71 BOARD: 2000 series —

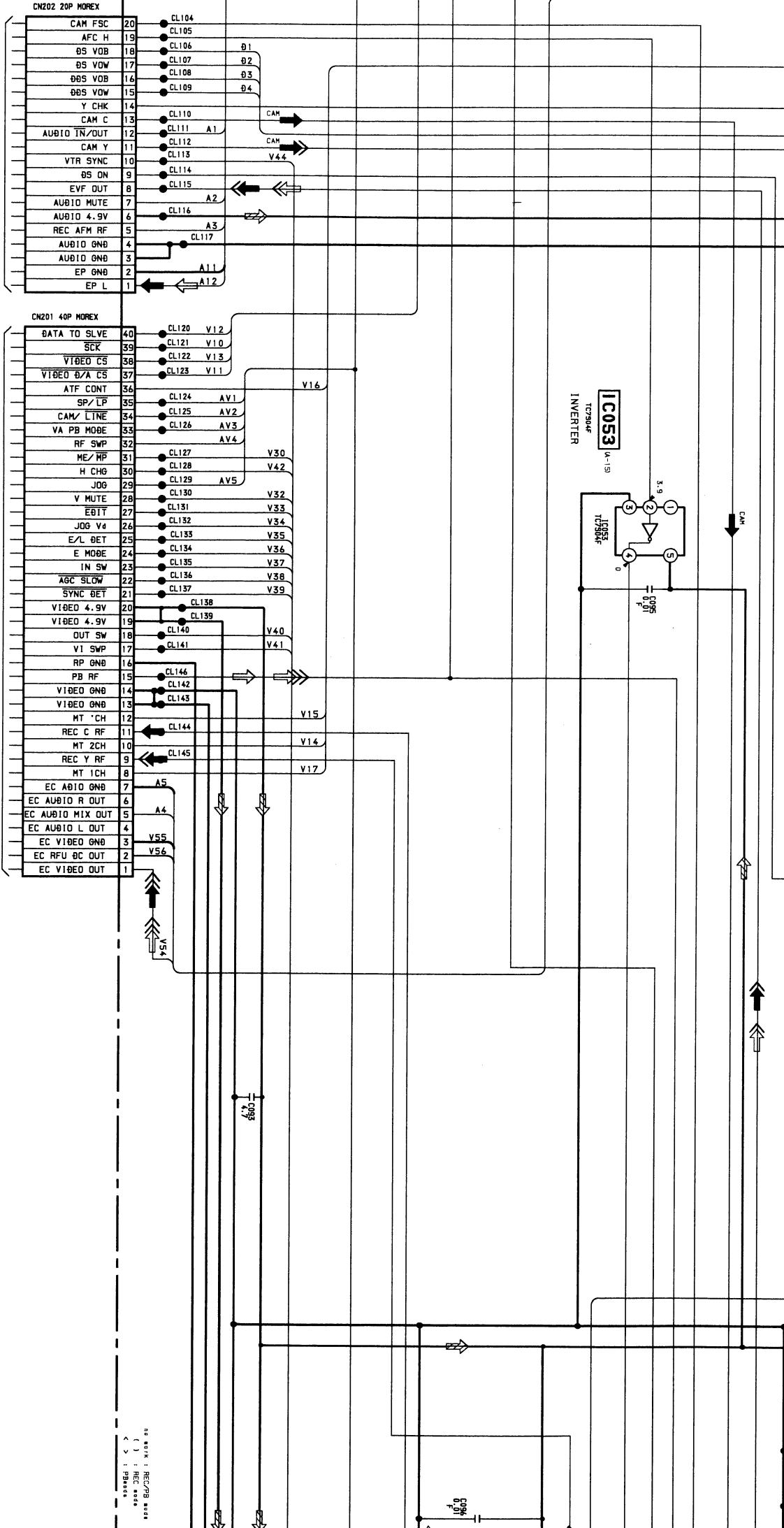
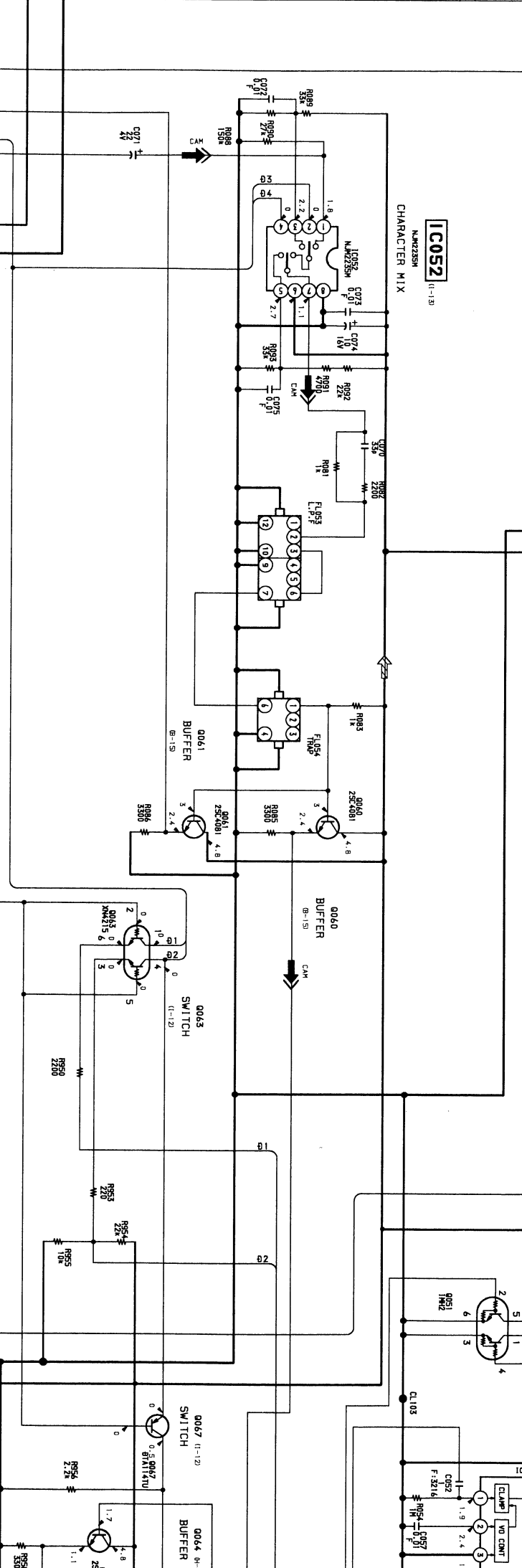
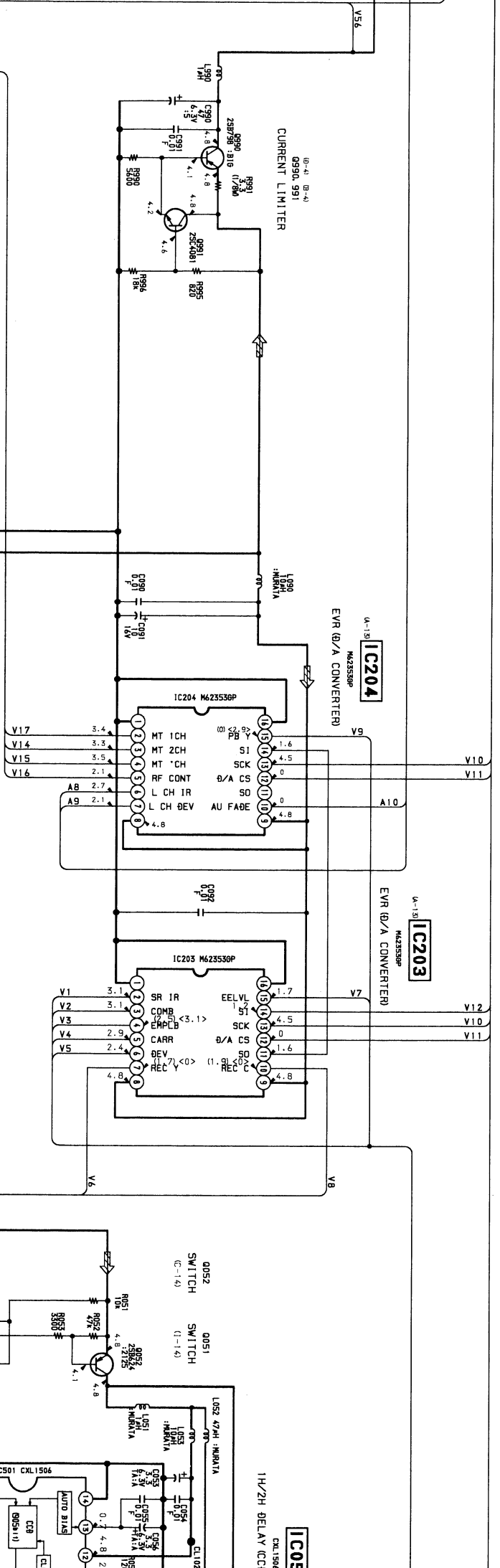


• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	↔	↔	↔	↔

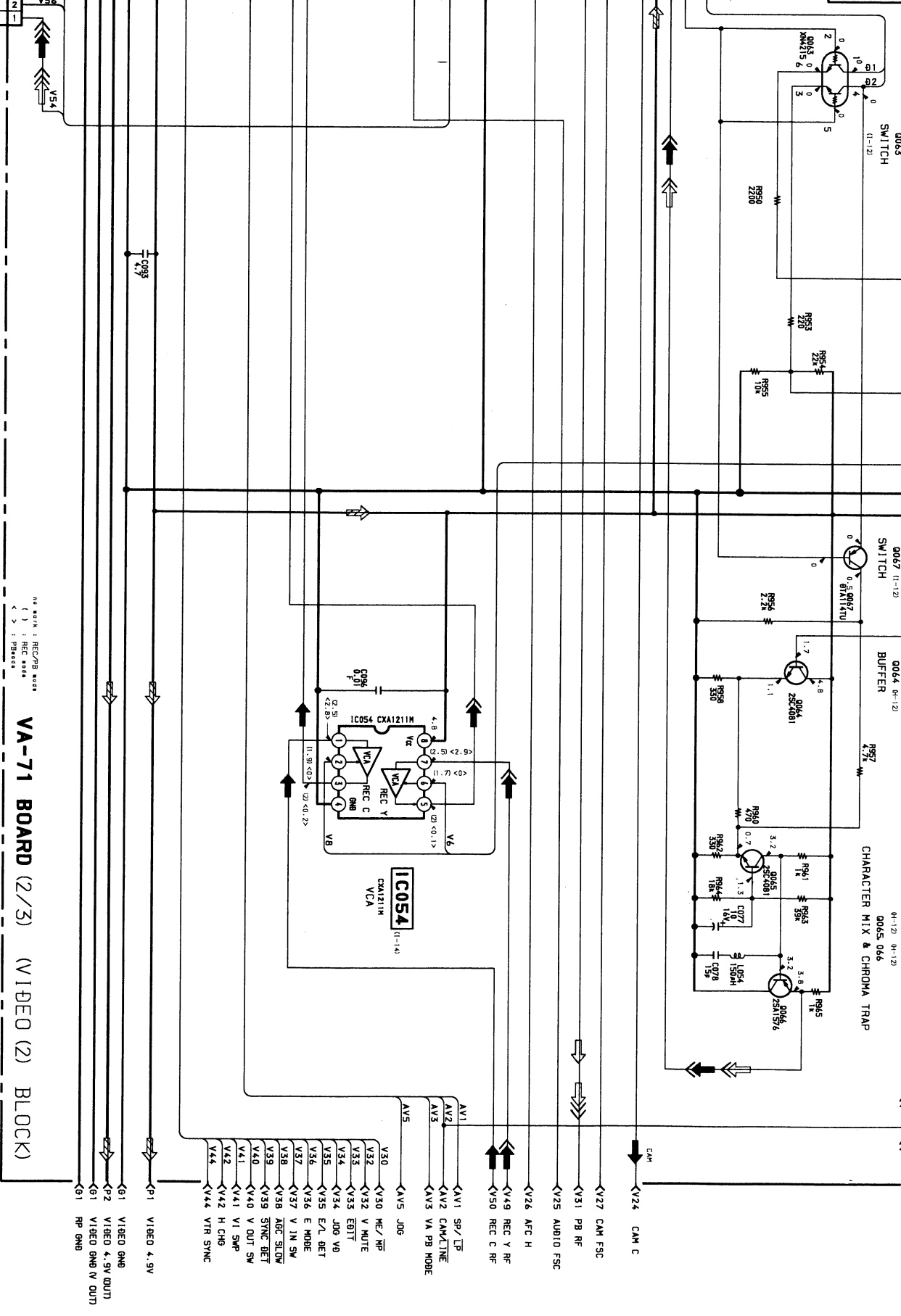
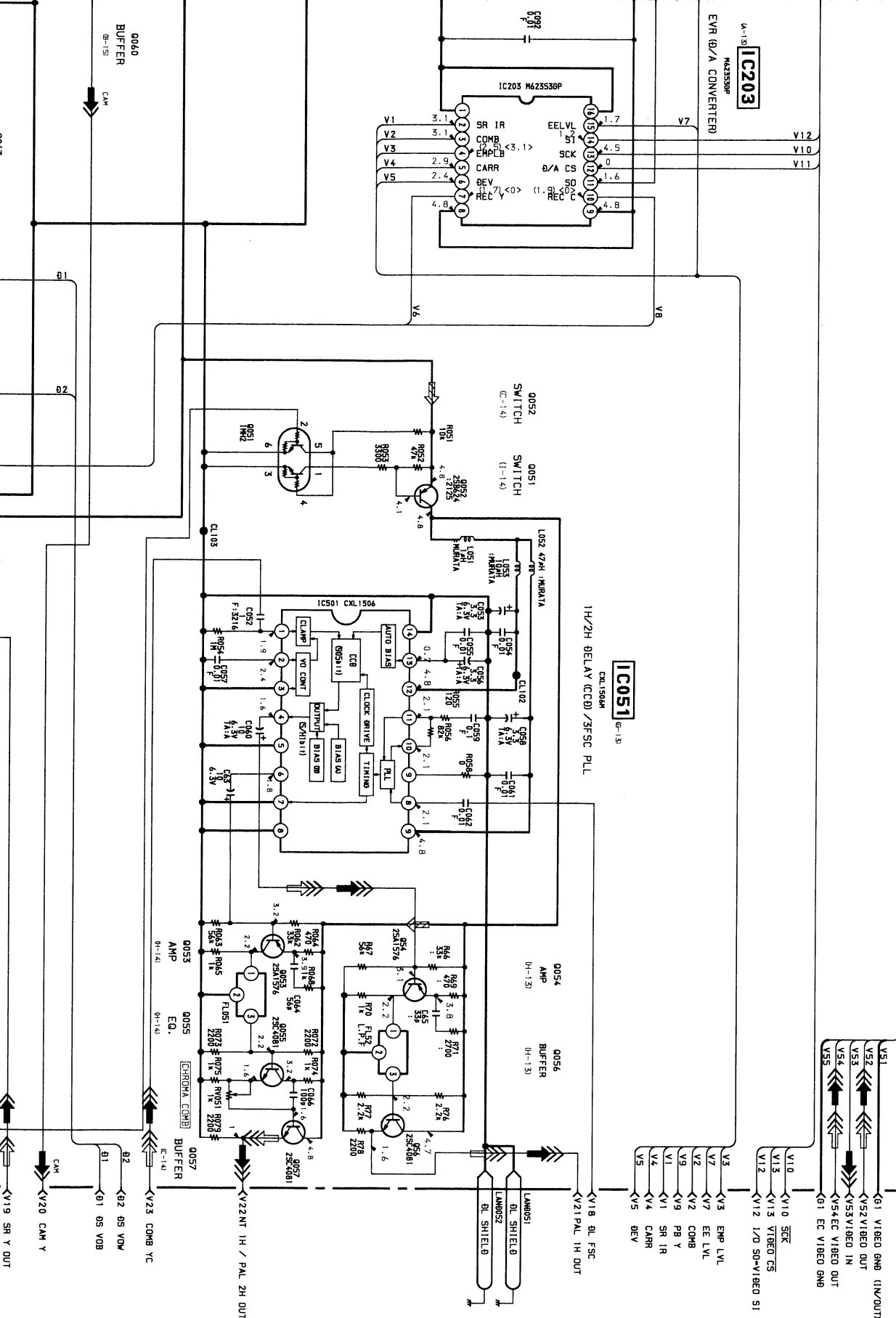
(See Page 122)

(See Page 122)

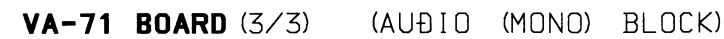


TO CS-31 BOARD CWS04 (See Page 106)

TO CS-31 BOARD CWS03 (See Page 107)

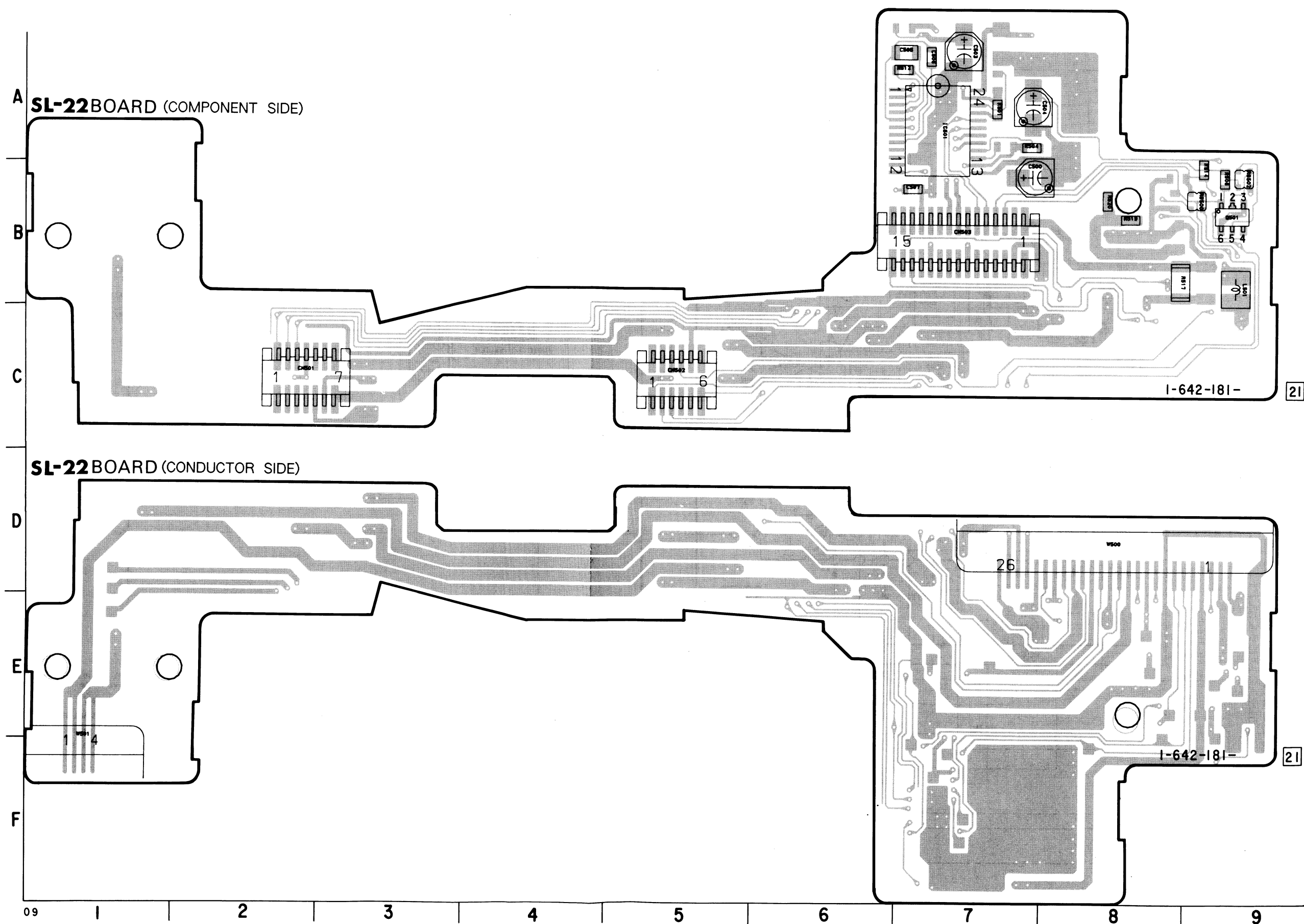


J

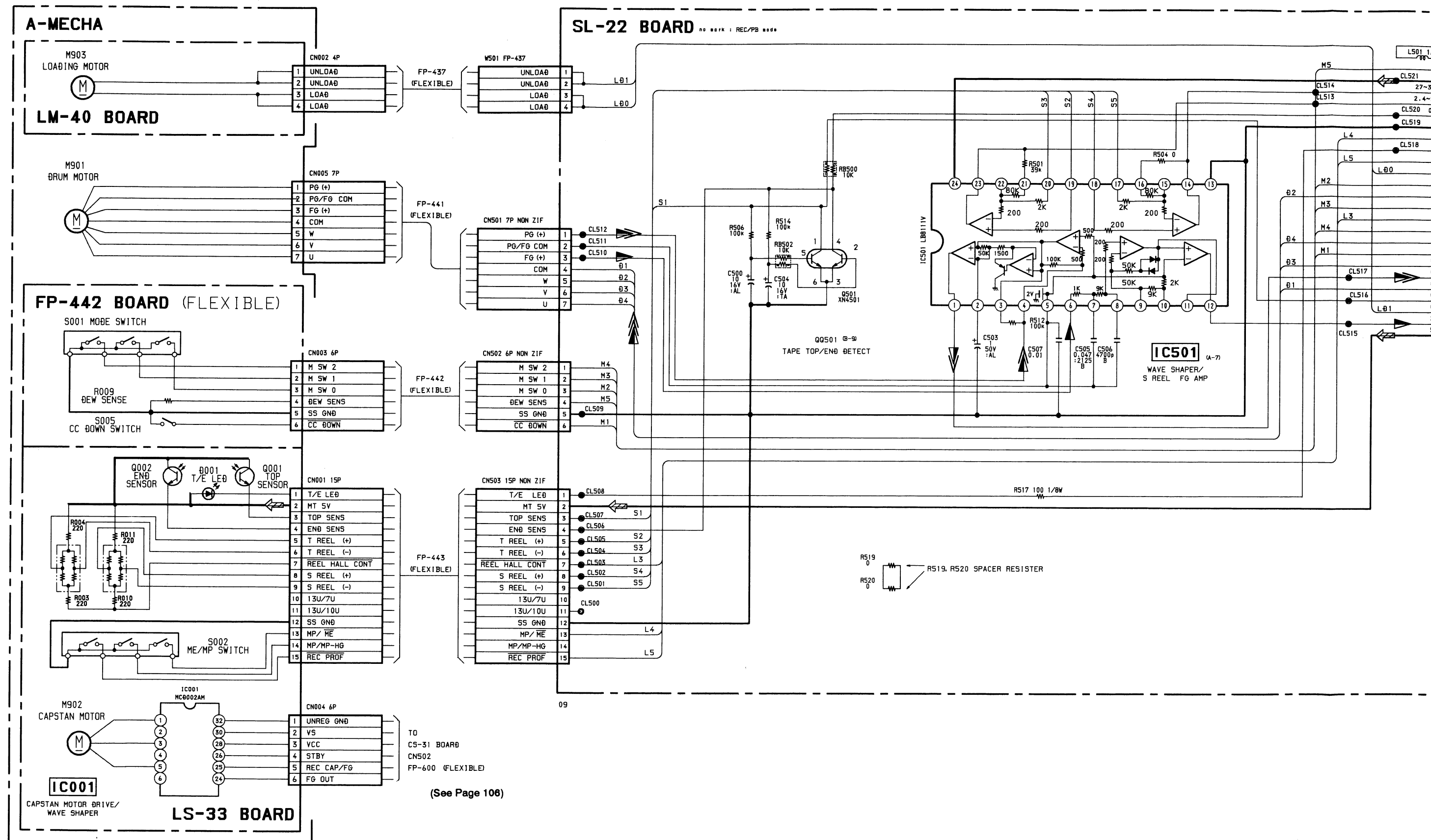


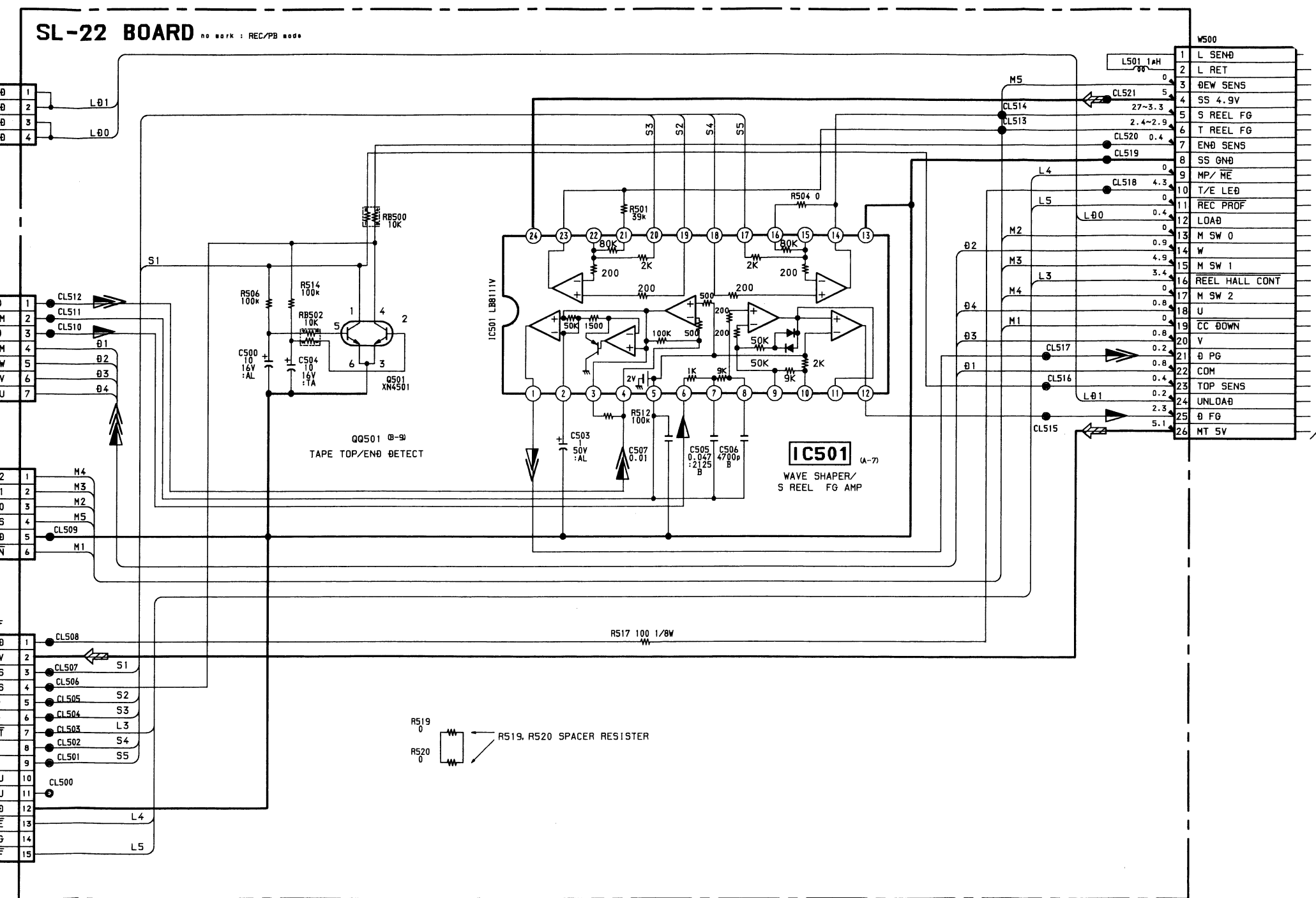
See Page 118)

— 122 —



— Ref. No. SL-22 BOARD: 3000 series —





TO
CS-31 BOARD
CN502
FP-600 (FLEXIBLE)

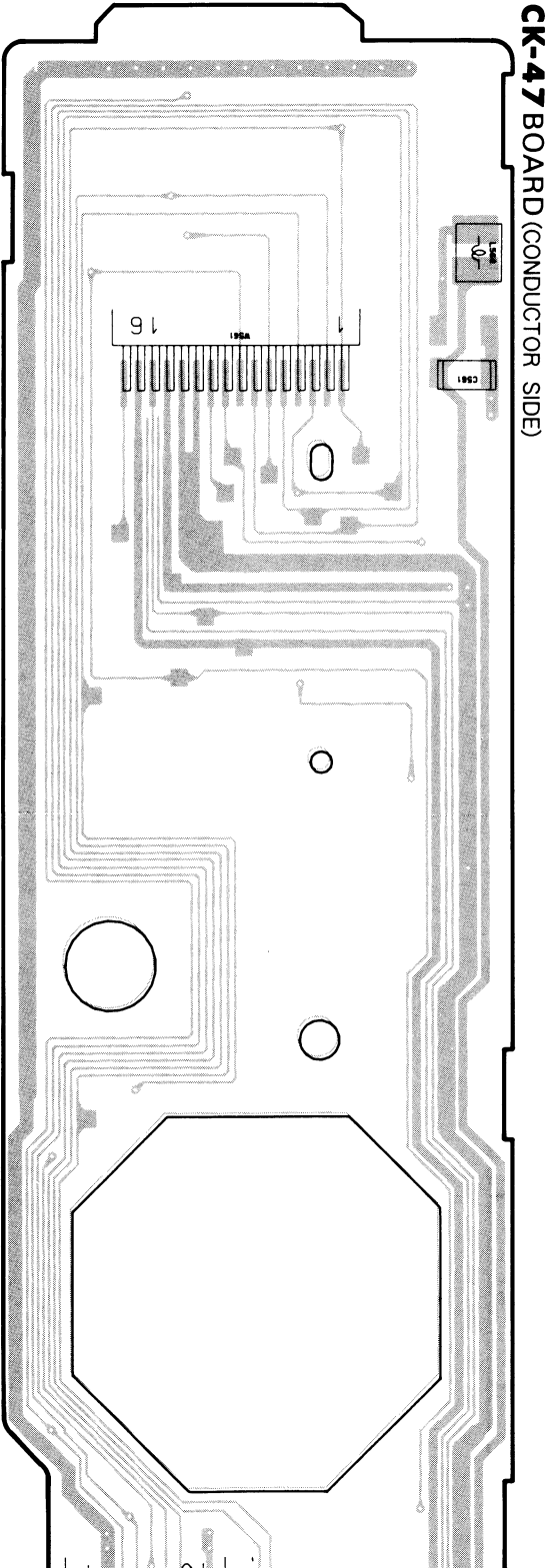
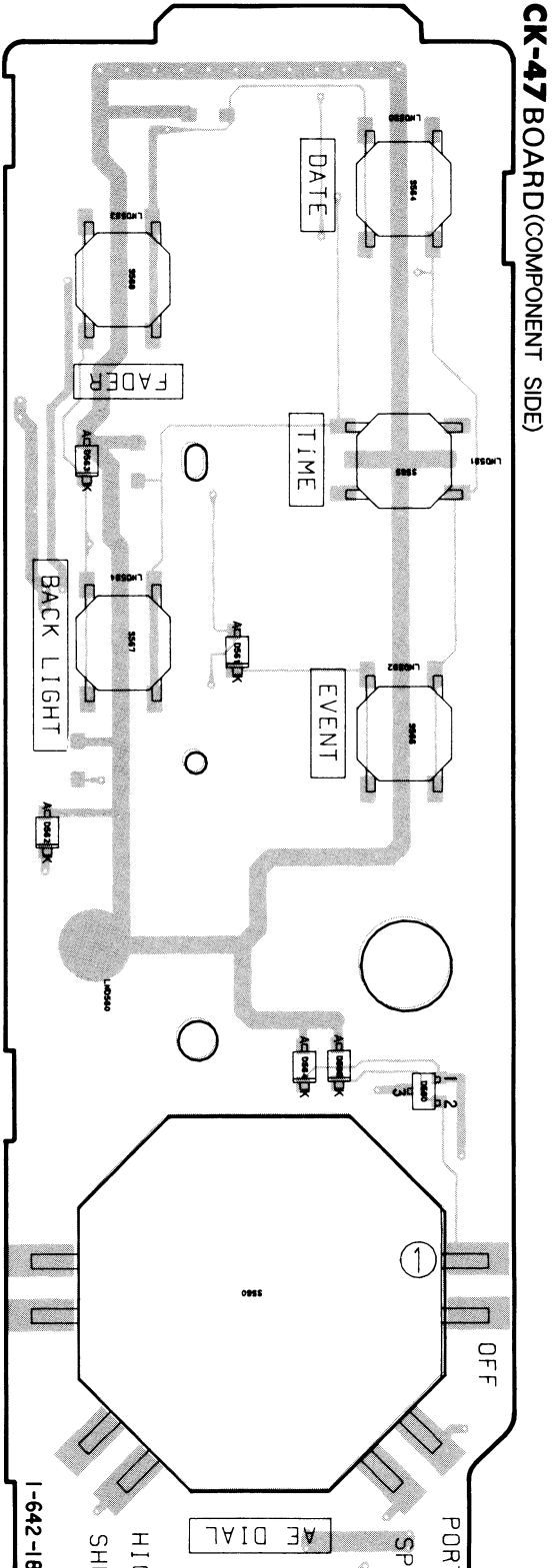
(See Page 106)

• SIGNAL PATH

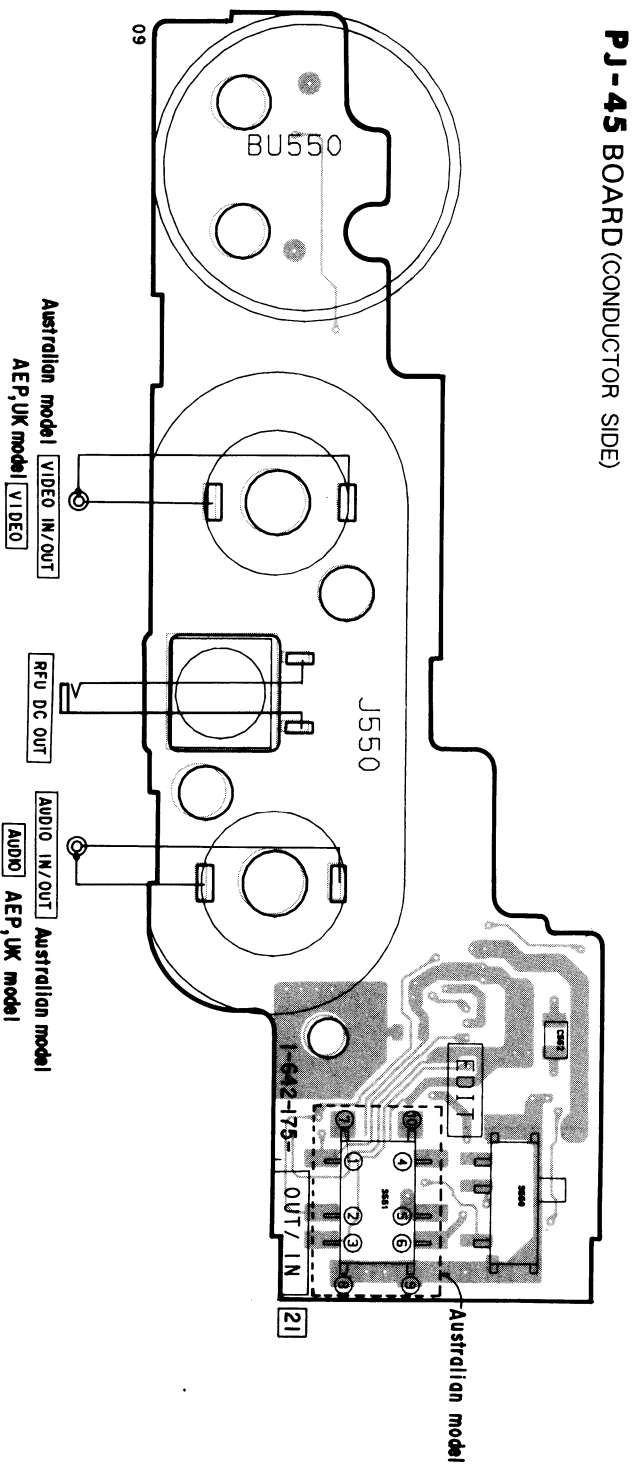
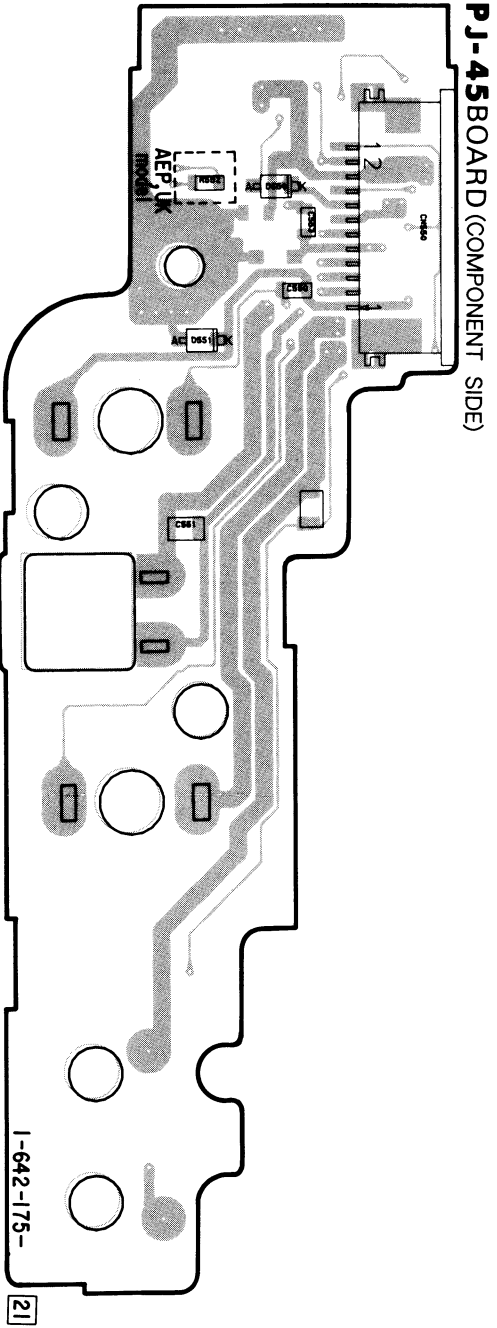
	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶▶	
Drum servo (speed and phase)		▶▶▶	
Capstan speed servo			
Capstan phase servo	▶▶	▶▶▶	▶▶▶
Capstan servo (speed and phase)		▶▶	
Ref. signal			

CK-47 (CAMERA CONTROL SWITCH), PK-30 (VTR/CAMERA SWITCH), DK-20 (RESET SWITCH), SW-200 (CAMERA START/STOP), VK
— Ref. No. MA-93 BOARD: 3000 series, VK-22 BOARD: 4000 series, SW-200 BOARD: 5000 series, CK-47 BOARD: 6000 series, DK-20 BOARD: 7000 series, PK-30 BOARD: 8000 series, P

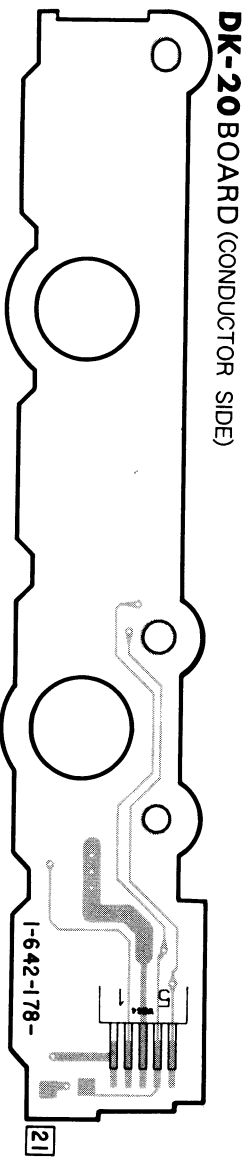
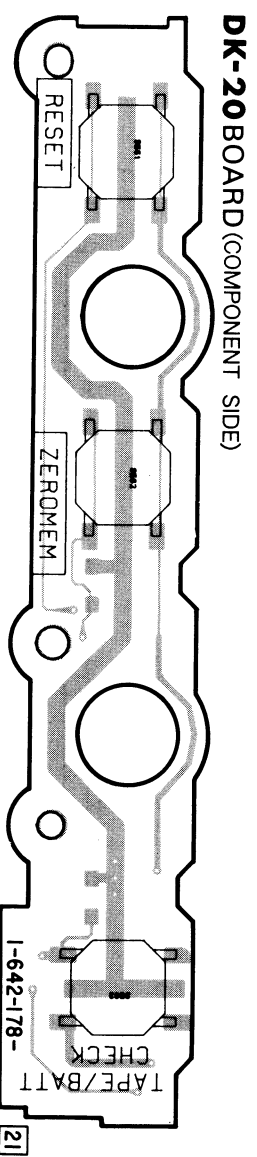
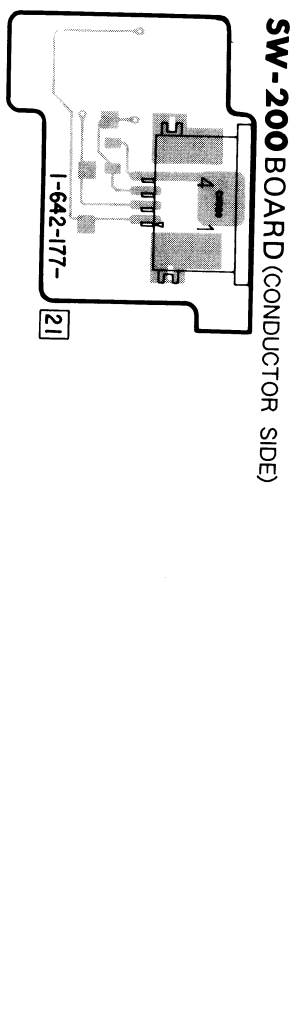
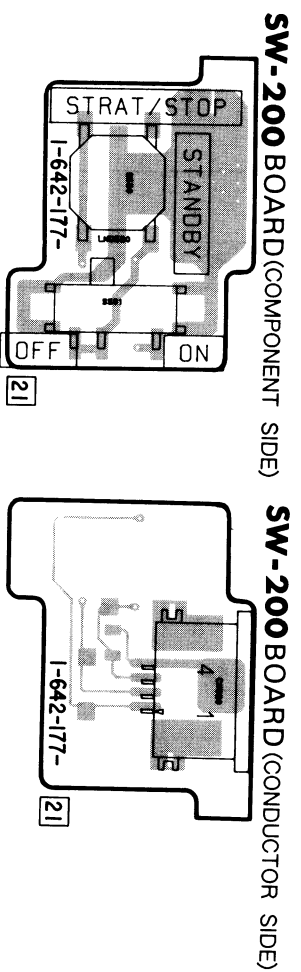
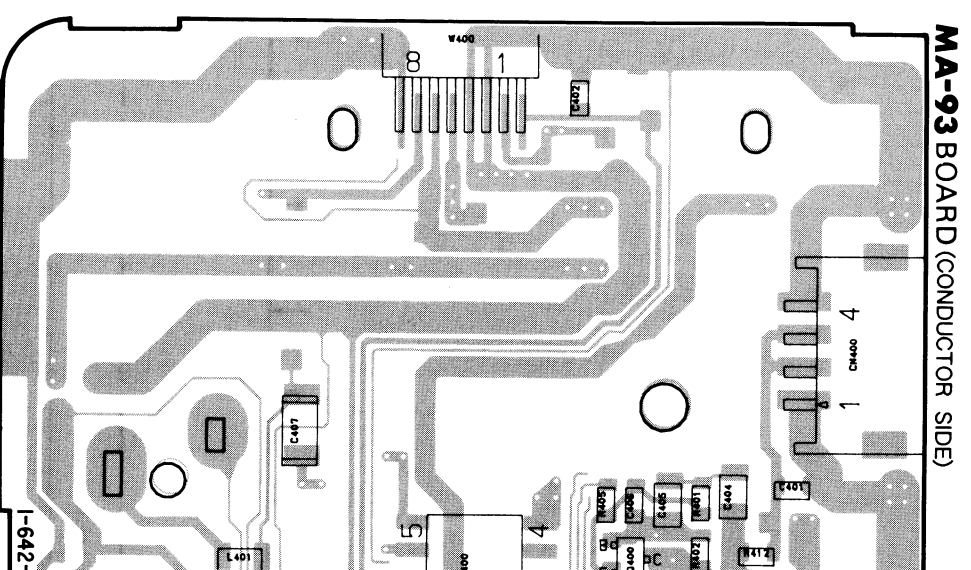
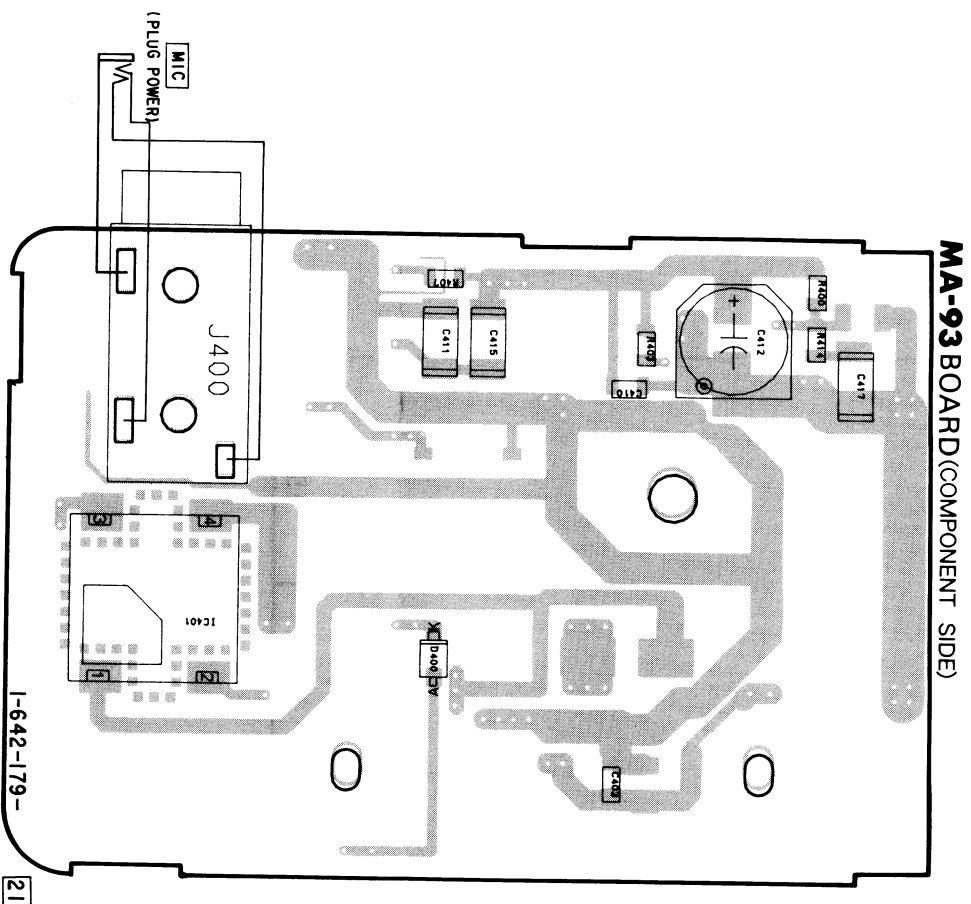
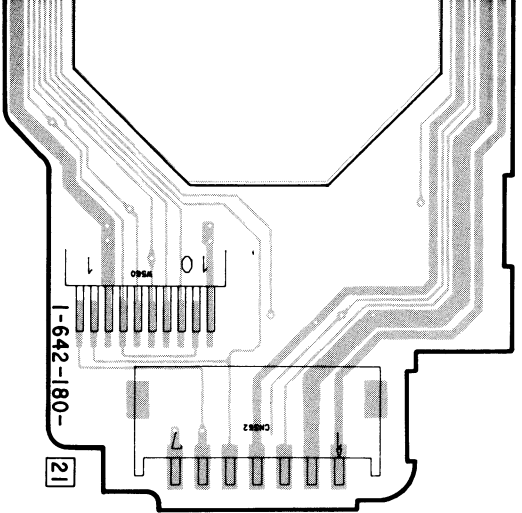
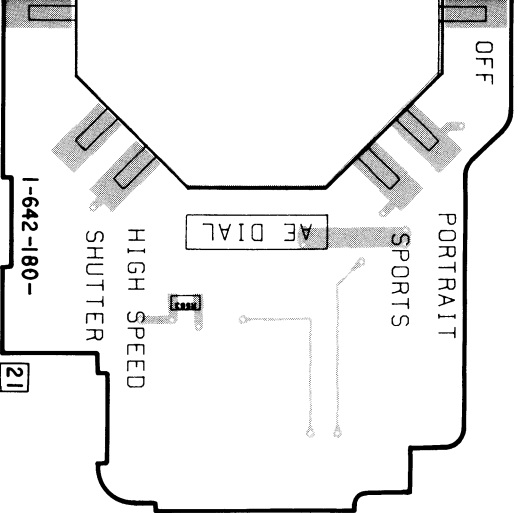
< DIODE >		
D560	8-719-820-05 DIODE	1SS181
D561	8-719-404-46 DIODE	MA110
D562	8-719-110-03 DIODE	RD7, SES-B2
D563	8-719-110-03 DIODE	RD7, SES-B2
D564	8-719-110-03 DIODE	RD7, SES-B2
D565	8-719-110-03 DIODE	RD7, SES-B2



< DIODE >		
D550	8-719-404-46 DIODE	MA110
D551	8-719-110-03 DIODE	RD7, SES-B2
D552	8-719-110-03 DIODE	RD7, SES-B2



< DIODE >			< IC >			< TRANSISTOR >					
D400	8-719-110-03	DIODE	RD7, SES-B2	IC400	8-759-822-37	IC	LA7293M-TE-L	Q400	8-729-905-23	TRANSISTOR	2SA1576-R
D401	8-719-110-03	DIODE	RD7, SES-B2	IC401	8-749-923-29	IC	RS-20E-T				



Australian model

21

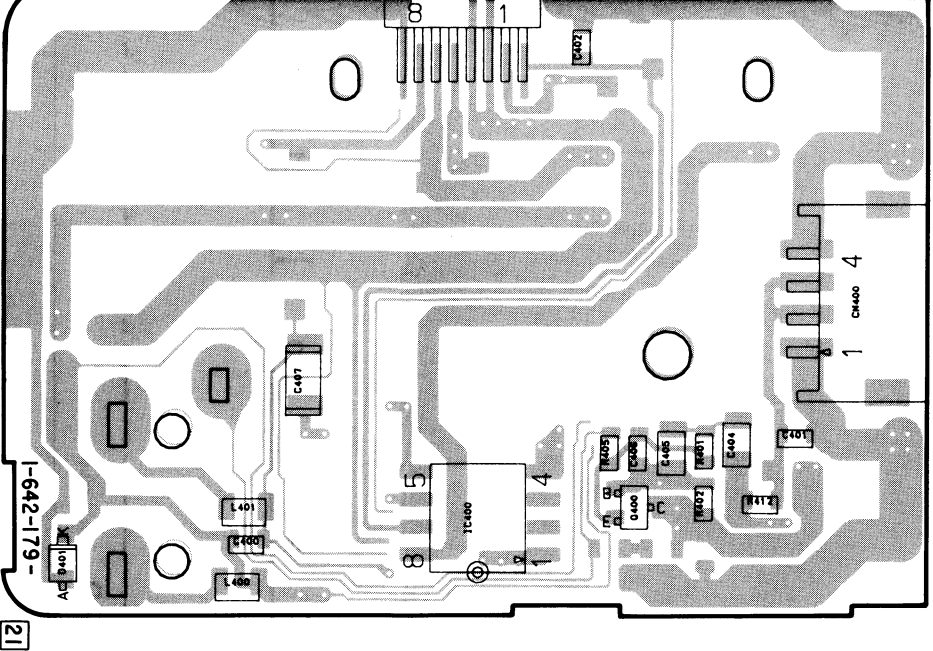
＜ TRANSISTOR ＞

0400 8-729-905-23 TRANSISTOR 2SA1576-R

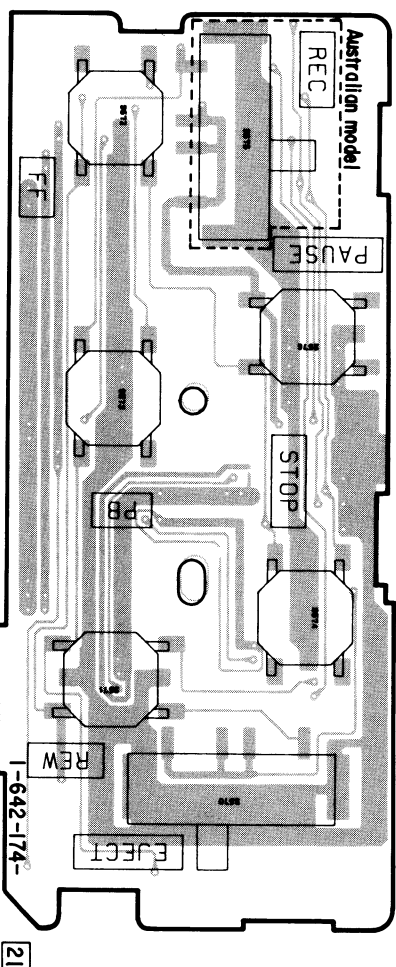
< DIODE >

D570 8-719-820-05 DIODE 1SS181

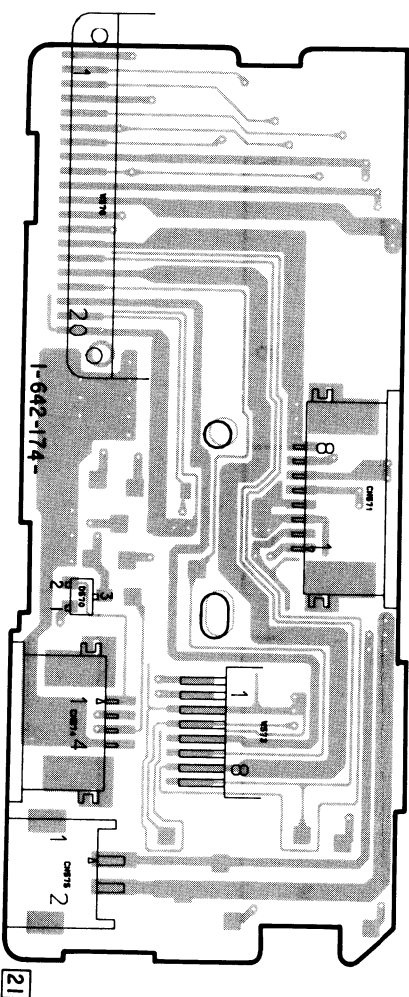
A-93 BOARD (CONDUCTOR SIDE)



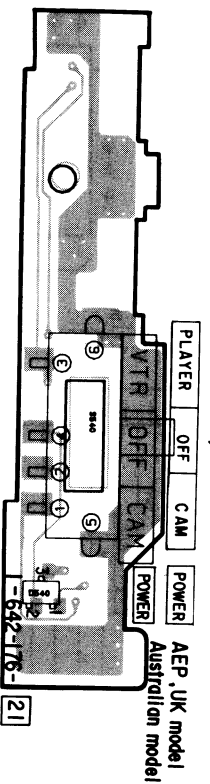
VK-22 BOARD (COMPONENT SIDE)



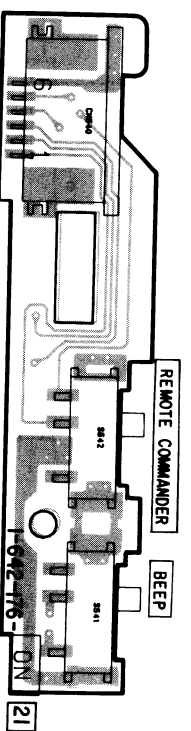
VK-22 BOARD (CONDUCTOR SIDE)



PK-30 BOARD (COMPONENT SIDE)



PK-30 BOARD (CONDUCTOR SIDE)



< DIODE >

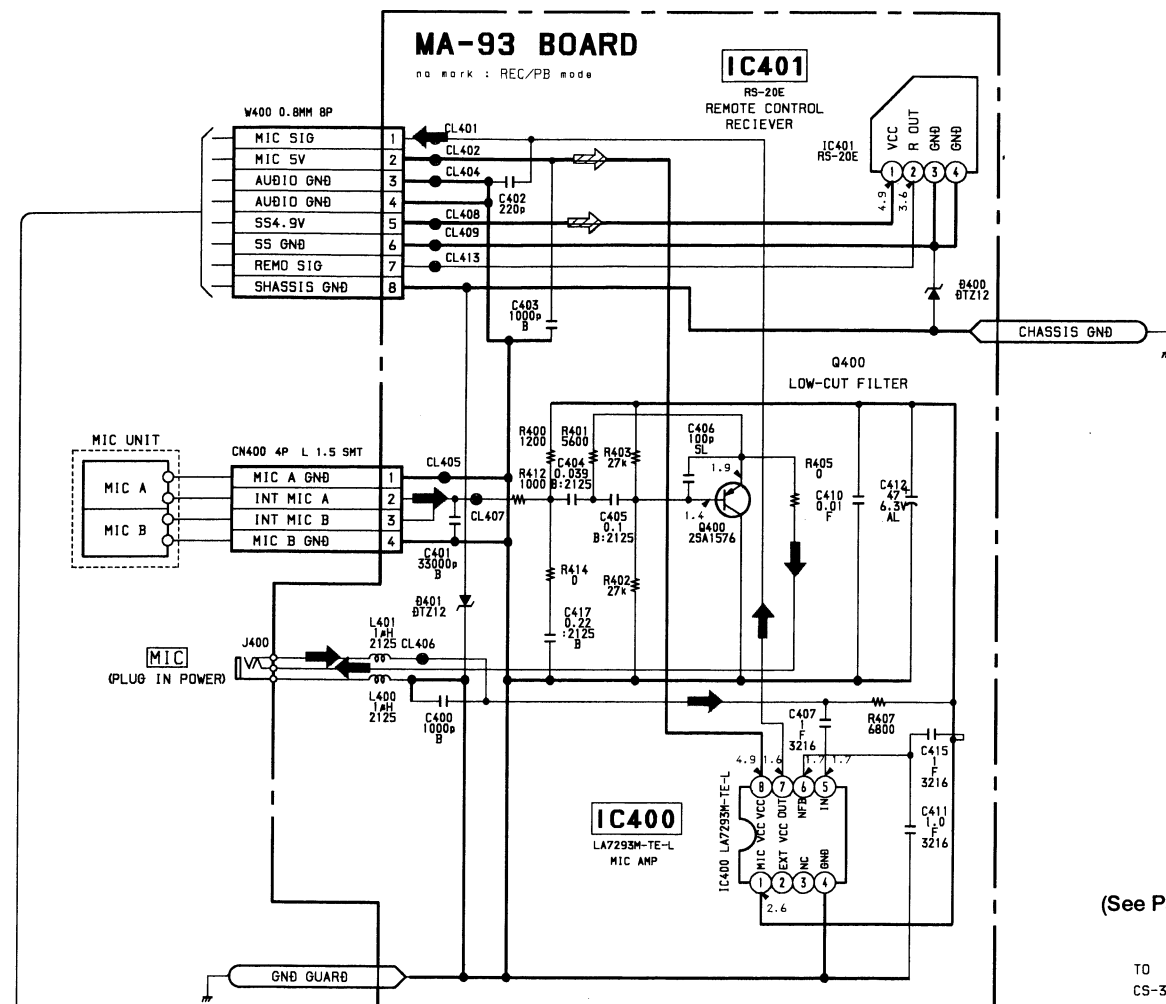
D540 8-719-820-05 DIODE 1SS181

FUNCTION SWITCH, LINE IN/OUT

FUNCTION SWITCH, LINE IN/OUT

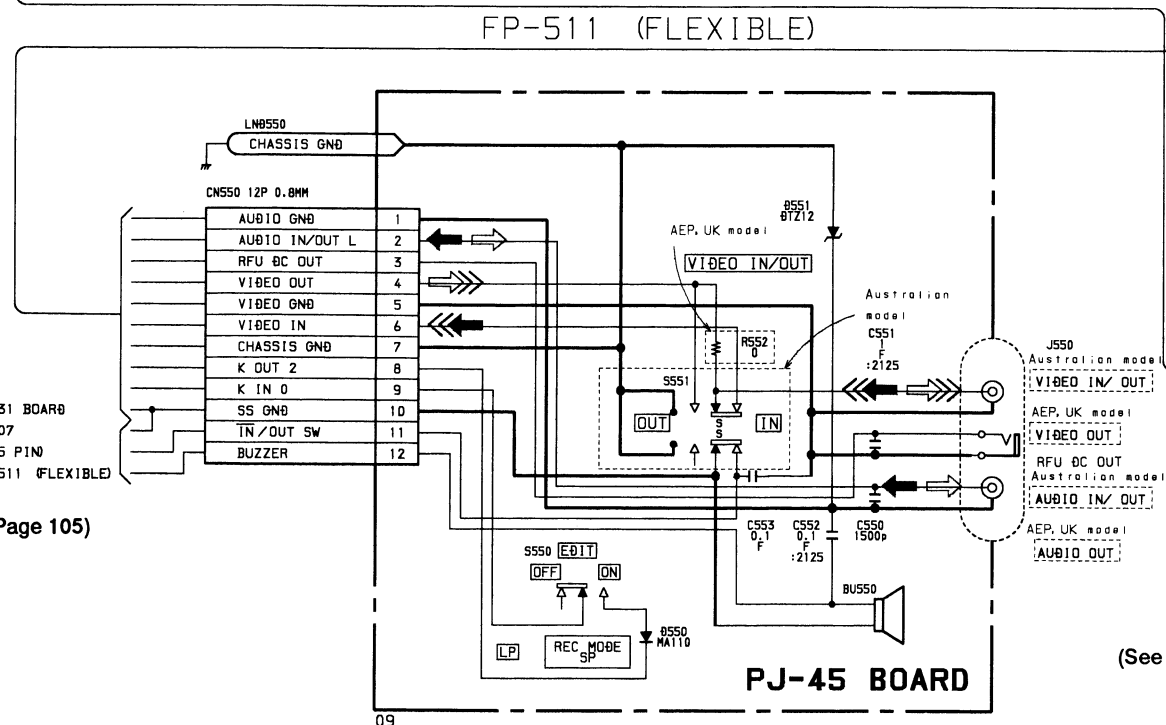
— Ref. No. MA-93 BOARD: 3000 series, VK-22 BOARD: 4000 series, SW-200 BOARD: 5000 series, CK-47 BOARD: 6000 series, DK-20 BOARD: 7000 series, PK-30 BOARD: 8000 series, PJ-45 BOARD: 9000 series —

A
B
C
D
E
F
G
H
I
J



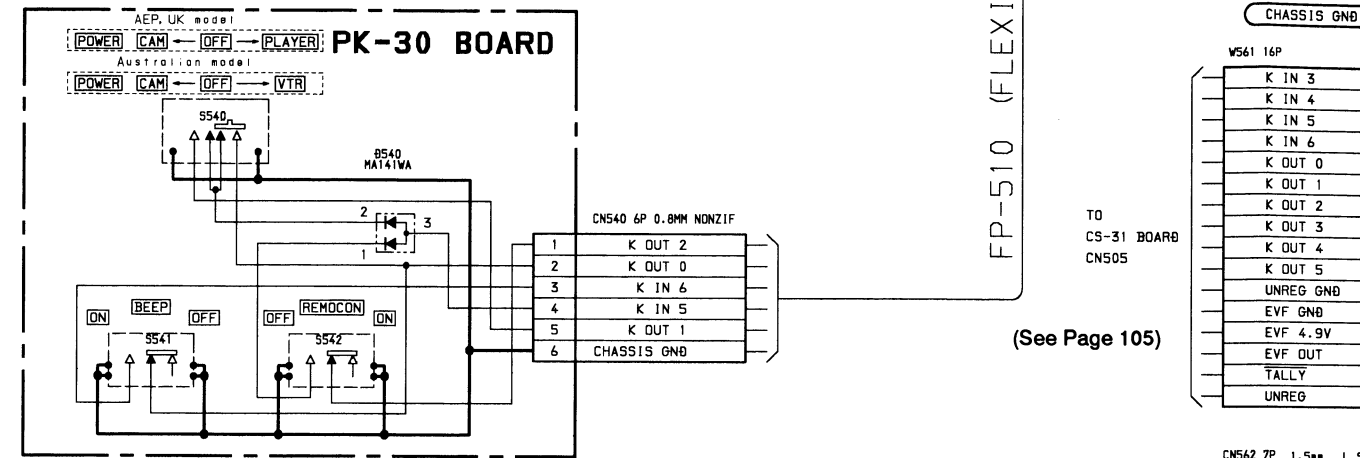
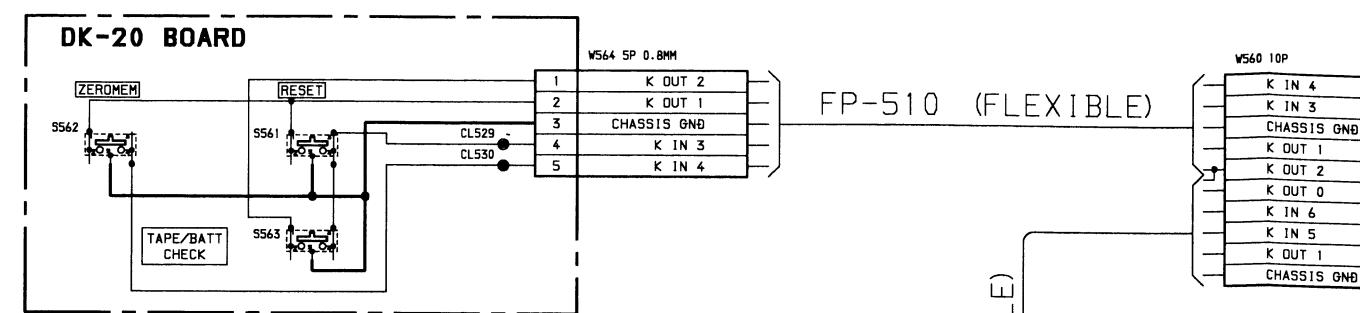
(See Page 105)

TO
CS-31 BOARD
CN507
(6-15 PIN)
FP-511 (FLEXIBLE)



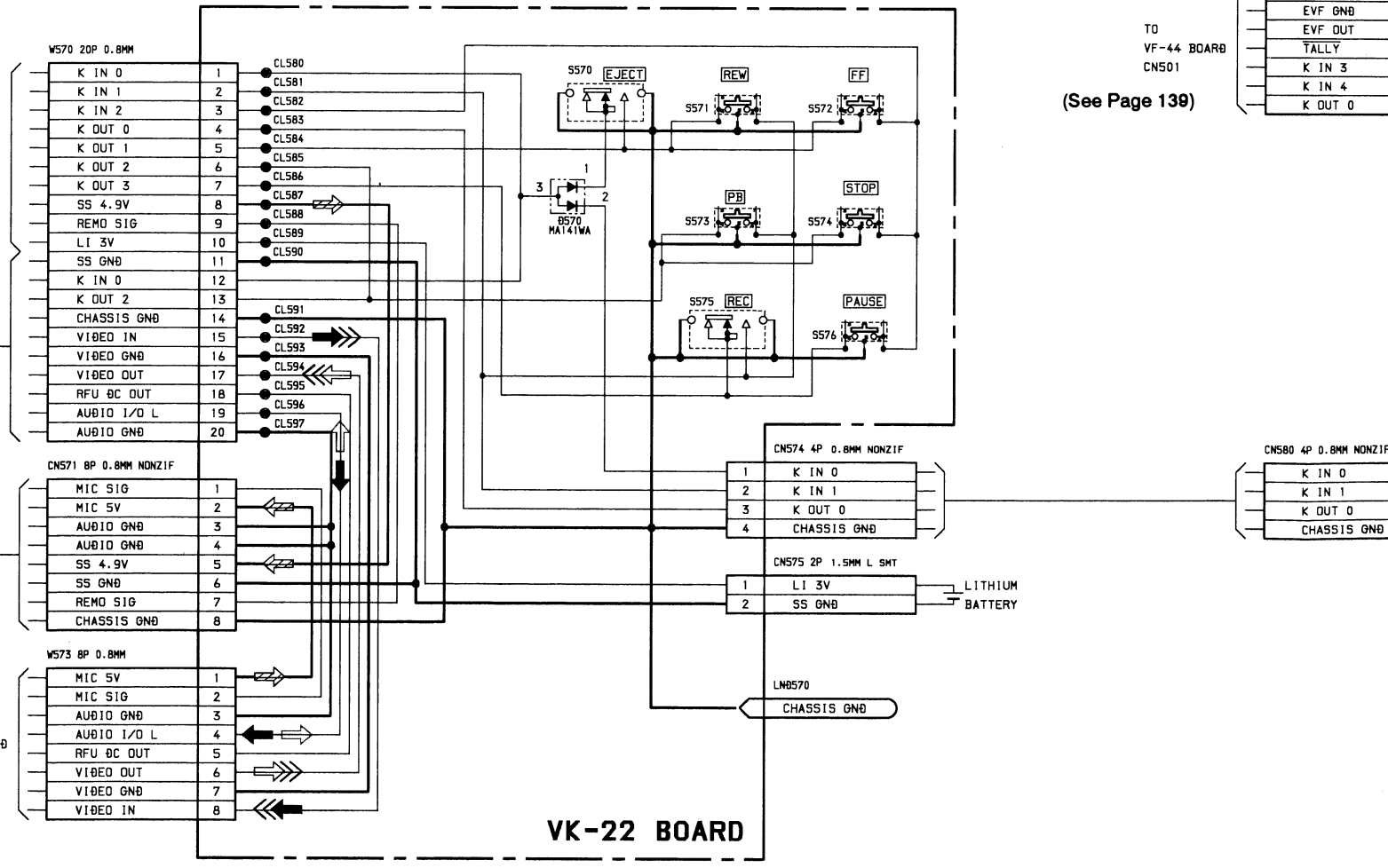
(See Page 105)

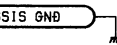
(See Page 122)



(See Page 105)

(See Page 139)

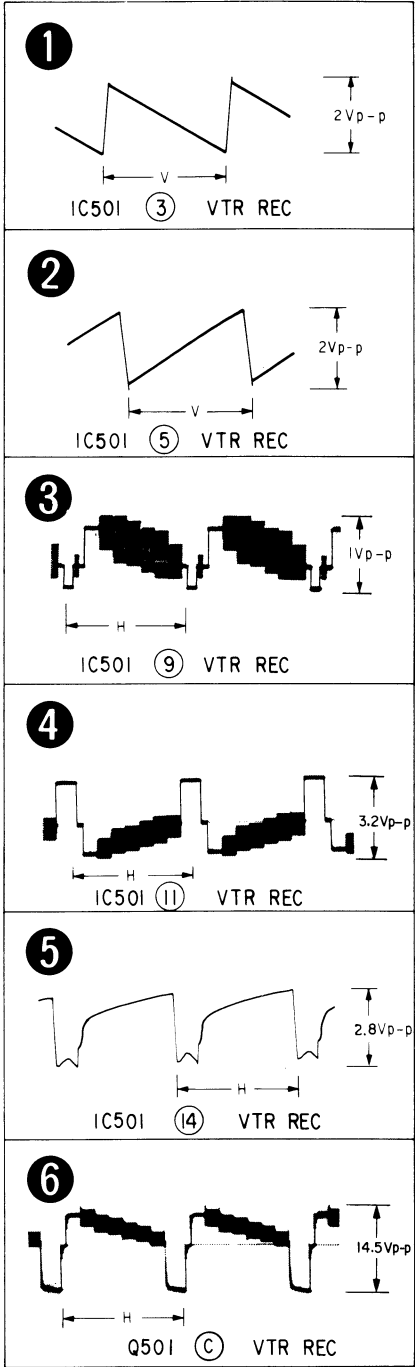




• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡➡➡➡	➡➡
PB			➡➡➡➡	➡➡

VF-44 BOARD



< DIODE >

D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

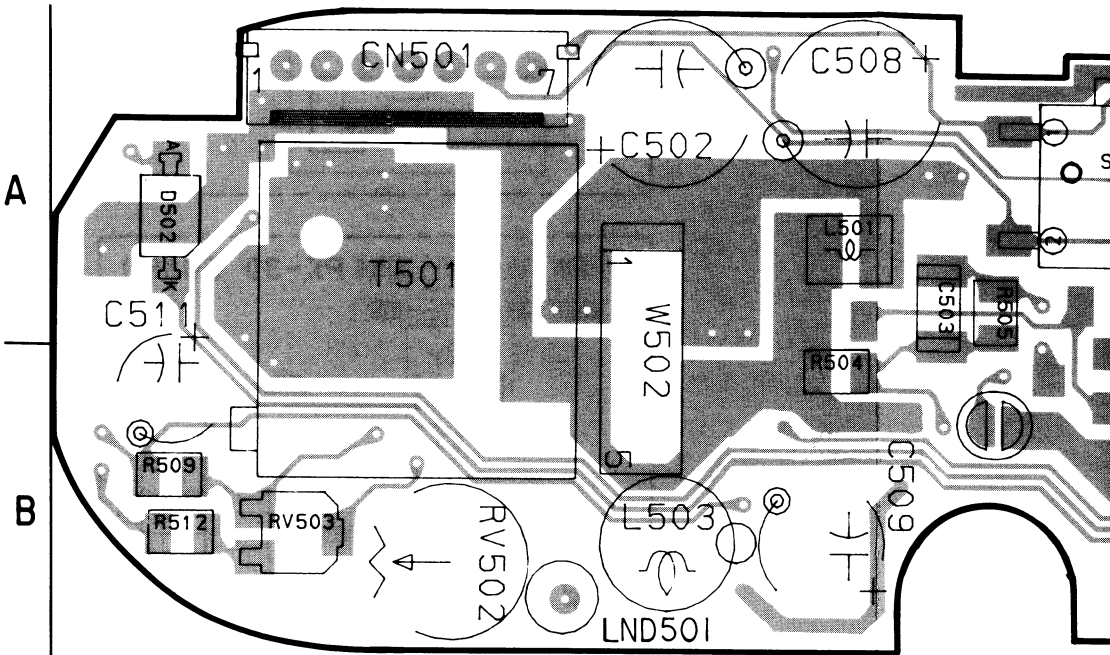
< IC >

IC501	8-759-420-01	IC	AN2512S
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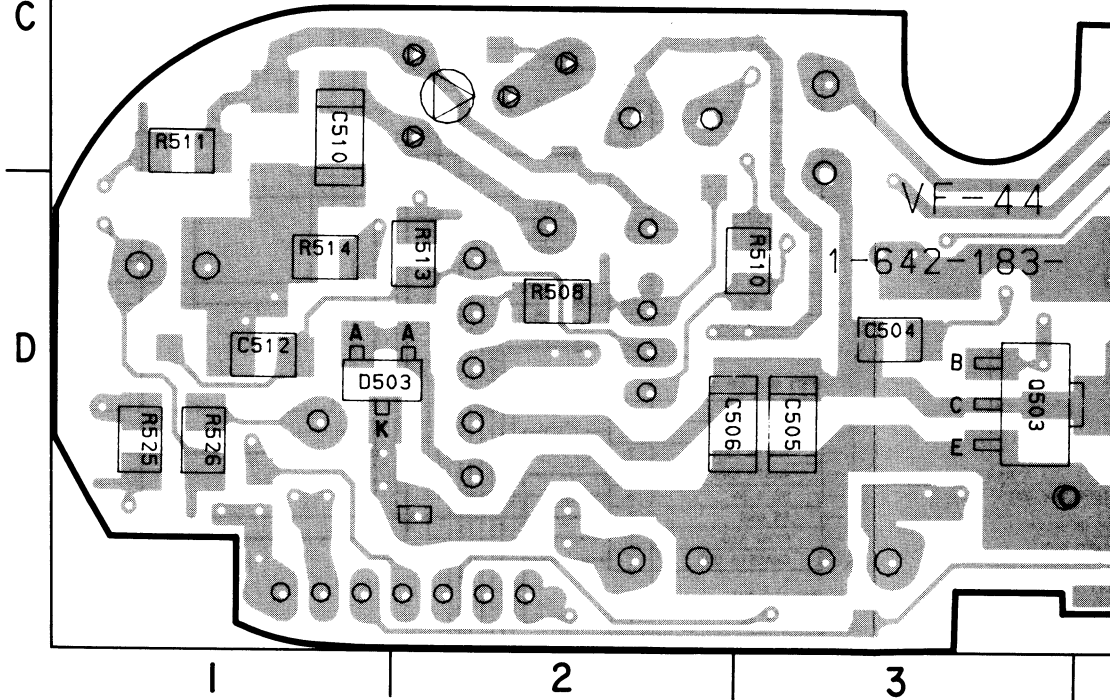
< TRANSISTOR >

Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

VF-44 (COMPONENT SIDE)



VF-44 (CONDUCTOR SIDE)

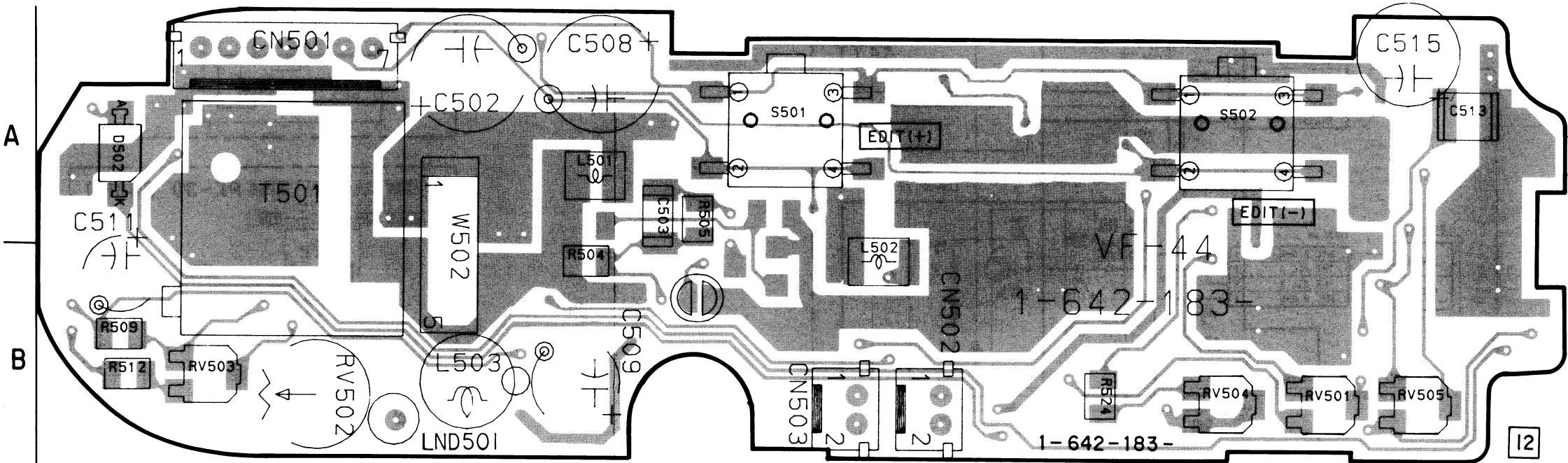


VF-44 (VIEW FINDER) PRINTED WIRING BOARD

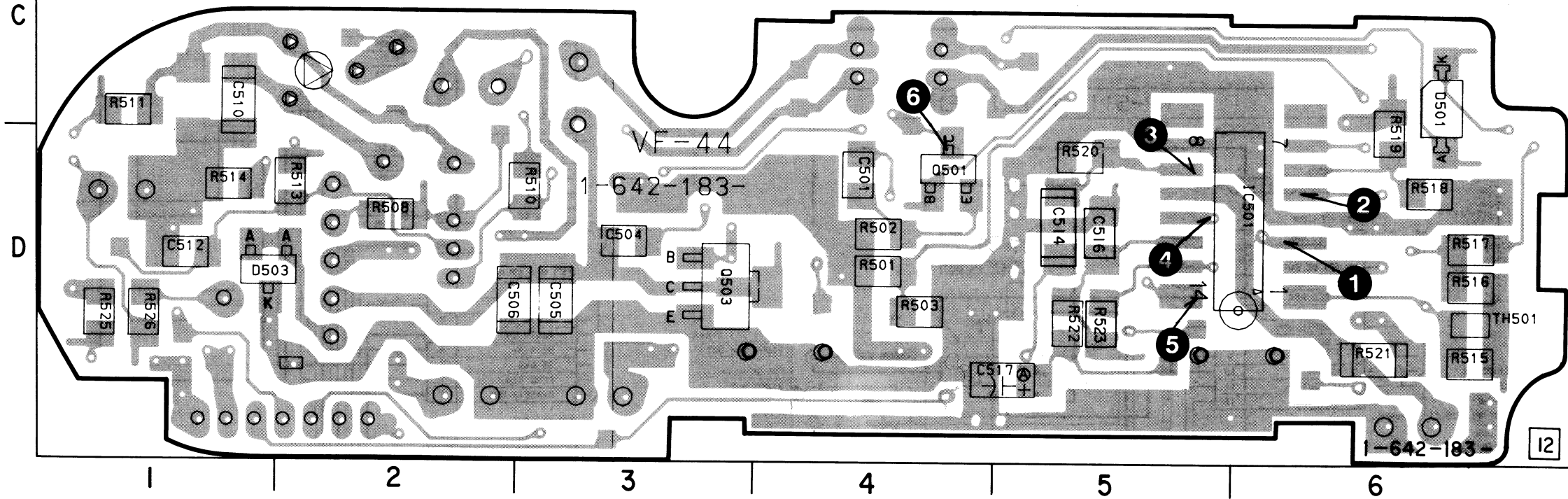
— Ref. No. VF-44 BOARD: 2000 series —

VF-44 (COMPONENT SIDE)

- < DIODE >
- D501 8-719-024-87 DIODE LN1261CAL
D502 8-719-024-87 DIODE LN1261CAL
D503 8-719-400-20 DIODE MA152WA
- < IC >
- IC501 8-759-420-01 IC AN2512S
- < TRANSISTOR >
- Q501 8-729-216-31 TRANSISTOR 2SA1163-G
Q503 8-729-106-68 TRANSISTOR 2SD1615A-GP

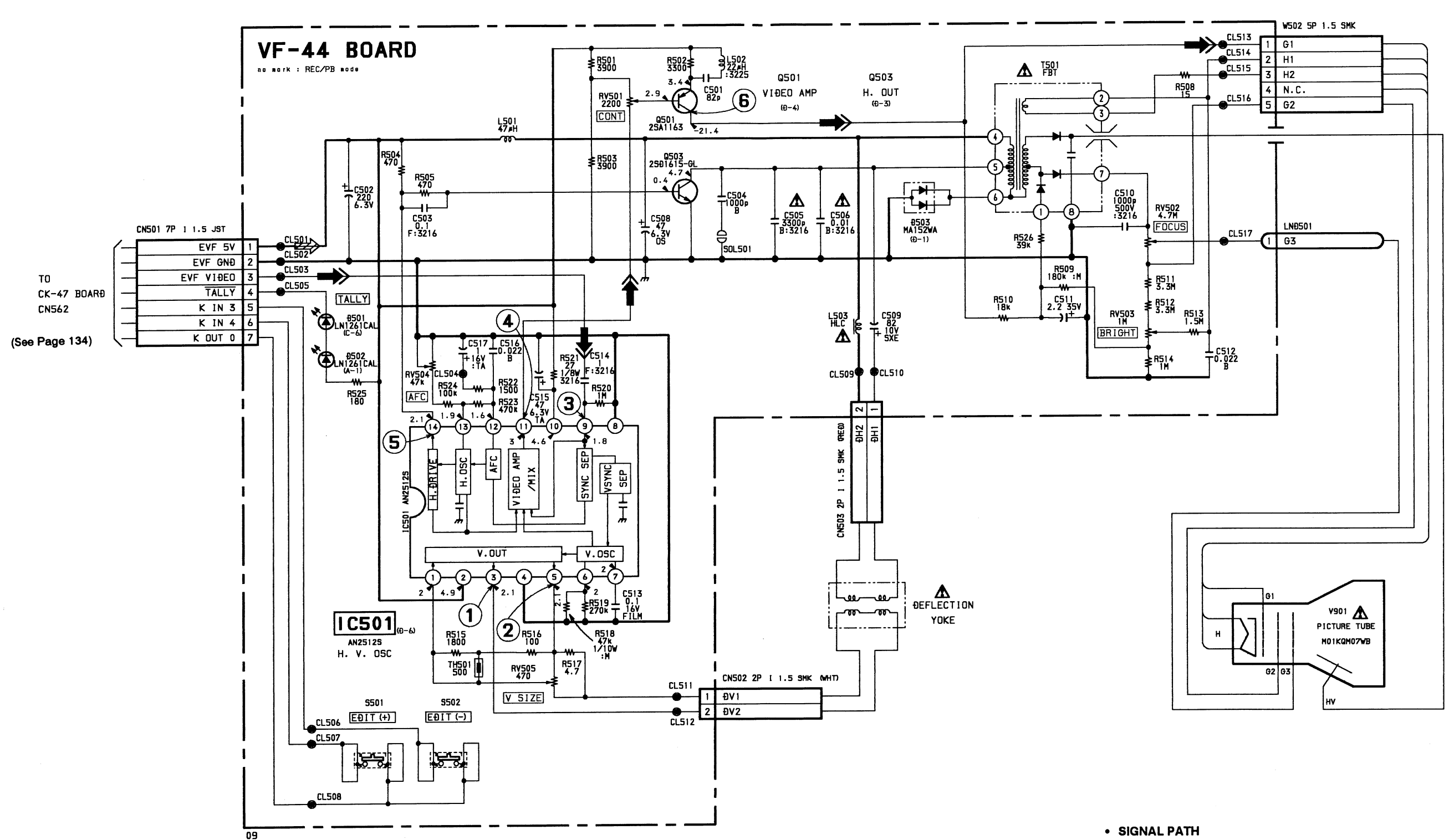


VF-44 (CONDUCTOR SIDE)



VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

— Ref. No. VF-44 BOARD: 2000 series —

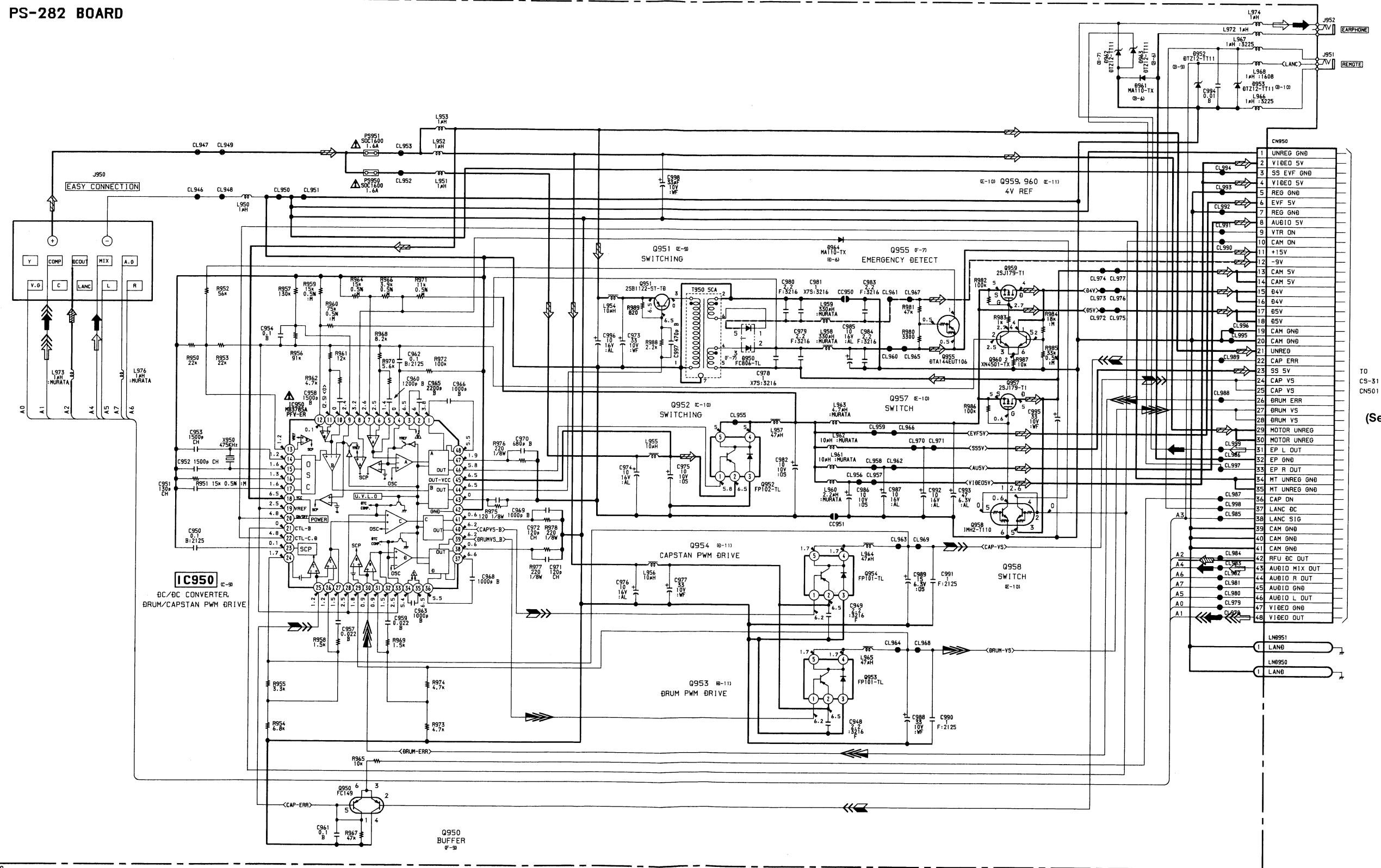


- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		➡➡		
PB				

— Ref. No. PS-282 BOARD: 3000 series —

PS-282 BOARD



TO
C5-31 BOARD
CN501

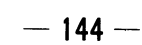
(See Page 105)

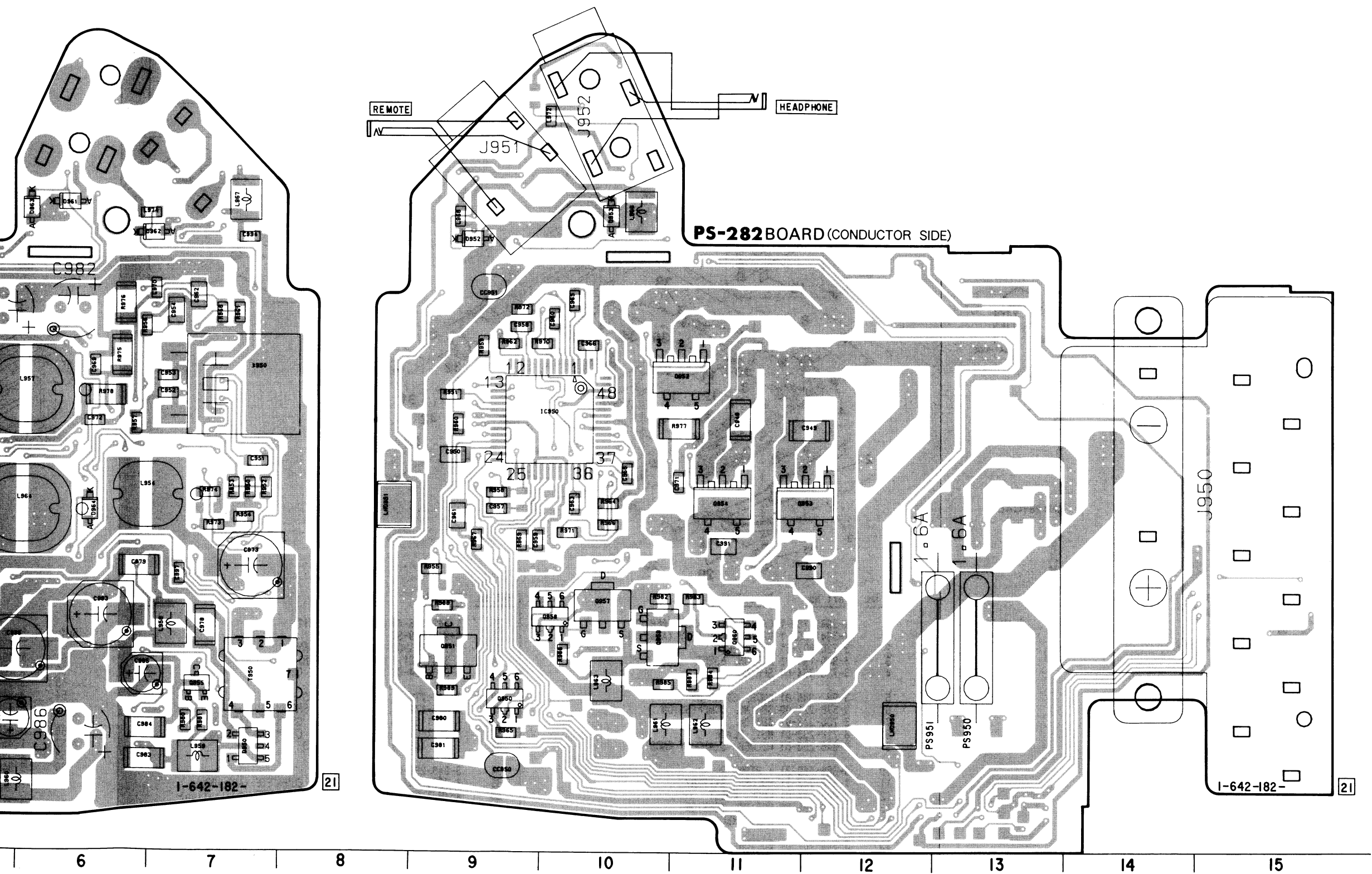
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡➡➡	➡
PB			➡➡➡	➡

	REC	REC/PB	PB
Drum speed servo		➡	
Drum phase servo		➡	
Drum servo (speed and phase)		➡➡	
Capstan phase servo	➡➡	➡➡➡	➡➡
Capstan servo (speed and phase)		➡➡	

— Ref. No. PS-282 BOARD: 3000 series —





< DIODE >

D950	8-719-989-33	DIODE	FC806
D952	8-719-110-03	DIODE	RD7. 5ES-B2
D953	8-719-110-03	DIODE	RD7. 5ES-B2
D961	8-719-404-46	DIODE	MA110
D962	8-719-110-03	DIODE	RD7. 5ES-B2

D963	8-719-110-03	DIODE	RD7. 5ES-B2
D964	8-719-404-46	DIODE	MA110

< IC >

△IC950	8-759-060-94	IC	MB3785APFV-G-BND-ER
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< TRANSISTOR >

Q950	8-729-823-95	TRANSISTOR	FC149
Q951	8-729-804-41	TRANSISTOR	2SB1122-ST
Q952	8-729-823-84	TRANSISTOR	FP102
Q953	8-729-823-82	TRANSISTOR	FP101
Q954	8-729-823-82	TRANSISTOR	FP101

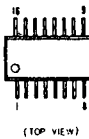
Q955	8-729-905-12	TRANSISTOR	DTA144EU
Q957	8-729-011-26	TRANSISTOR	2SJ179
Q958	8-729-920-48	TRANSISTOR	1MH2
Q959	8-729-011-26	TRANSISTOR	2SJ179
Q960	8-729-402-81	TRANSISTOR	4N4501

4-3. SEMICONDUCTORS

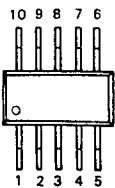
AK6420F
LM358D



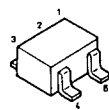
CXA1448N
CXA1452
M62353GP
μPD6456GS-618-E2



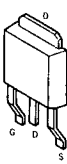
LB1830M



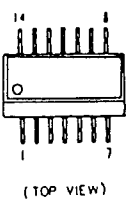
SC7S04F
TC4S66F



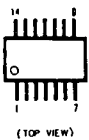
2SJ179



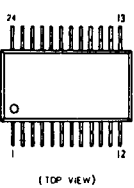
AN2512S



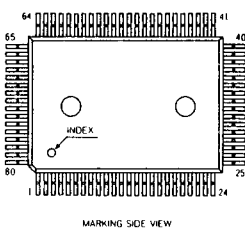
CXA1452
CXL5502M
TL1596CDB



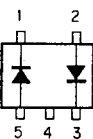
LB8111V



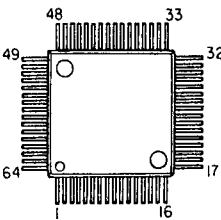
μPD75316GF-234-3B9



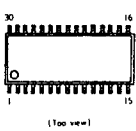
FC806-TL



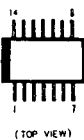
CXA1207AR
CXD1257R



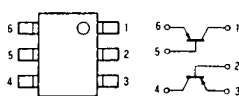
CXA8006M



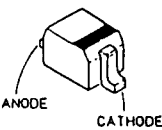
LM324D



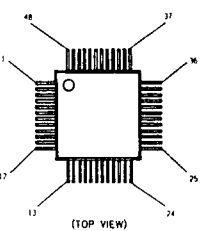
FC149
XN4401



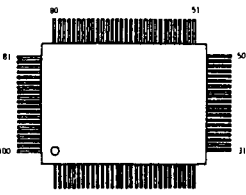
MA110



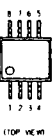
CXA1208R
CXA-1488R
CXA1507BR
TB1206F-EL



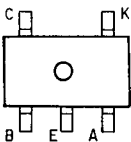
CXD2100Q
CXP80624-269Q/270Q



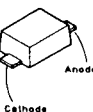
NJM2235M



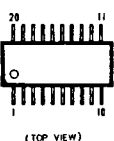
FP101
FP102



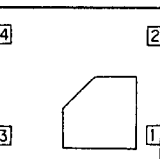
MA728



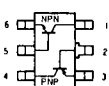
CXD2104N
M62352GP
MPC1720M
MPC1724M
μPD7564G-540



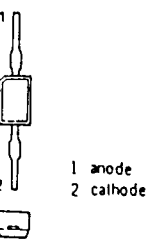
RS-20E-T



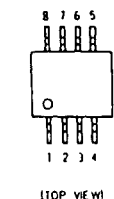
XN4312
XN4601



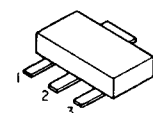
LN1261CAL



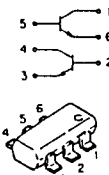
CXA1211M
LA7293M
RC3414M



S-81350HG-KD



1MH2
XN4215
XN4501



SECTION 5
EXPLODED VIEWS

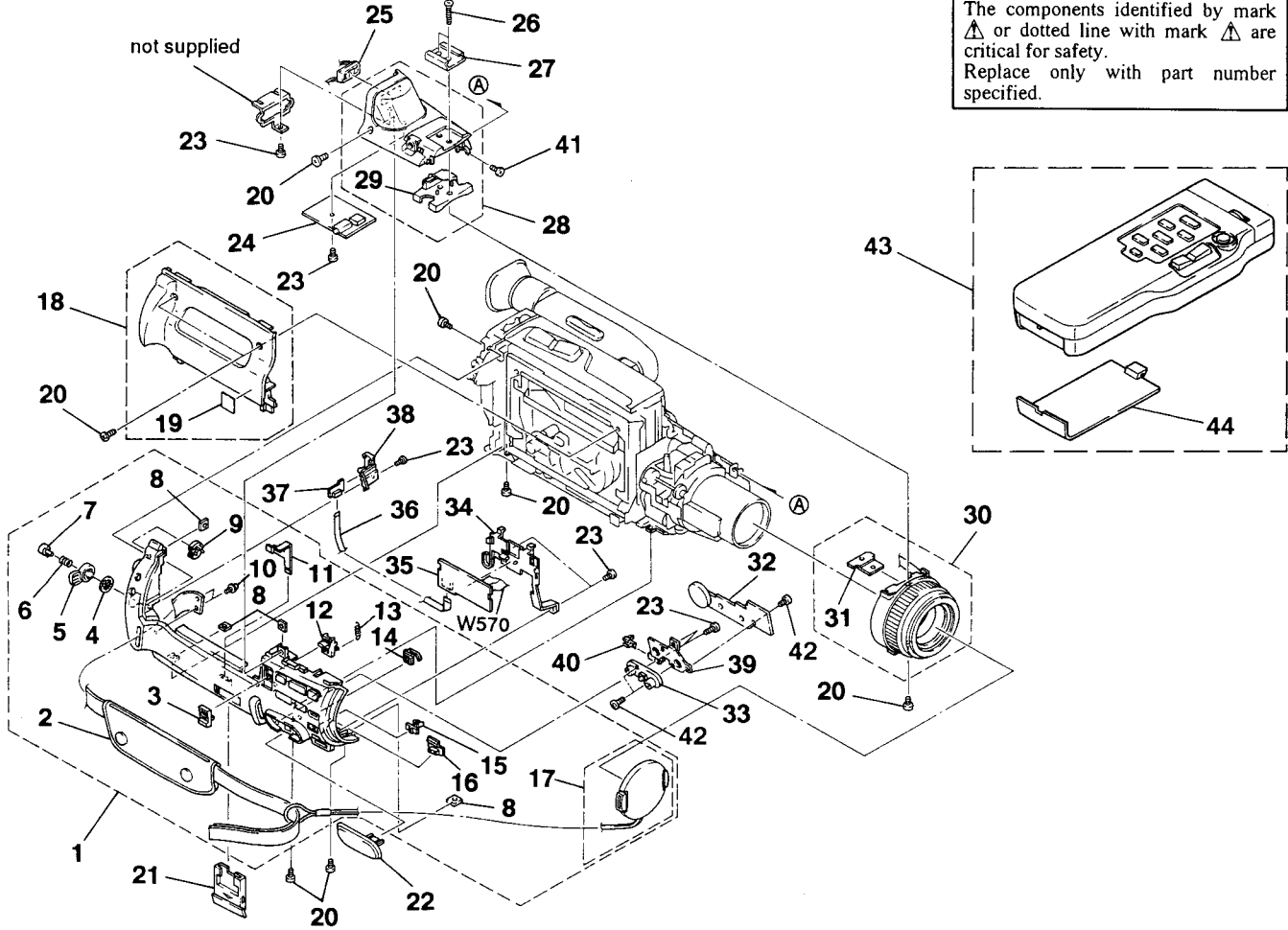
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

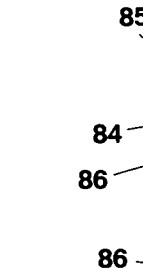
5-1. CABINET (UPPER), (L) ASSEMBLIES



The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	X-3941-789-1	CABINET (L) ASSY (AEP, UK)		25	1-542-126-41	MICROPHONE UNIT	
1	X-3941-955-1	CABINET (L) ASSY (Australian)		26	3-948-809-31	SCREW (M2X12)	
2	3-736-807-01	BELT, GRIP		27	3-724-511-01	SHOE, ACCESSORY	
3	3-946-195-01	BUTTON, EJECT		28	X-3941-321-1	CABINET (UPPER) ASSY	
4	3-736-364-01	SPRING		29	3-946-234-01	PRISM, REMOTE CONTROL	
5	3-942-985-01	KNOB, STAND-BY		30	1-241-771-11	RES. VAR (FOCUS RING)	
6	3-578-221-00	SPRING, COMPRESSION		31	3-946-172-01	SHEET METAL, SHOE	
7	3-736-343-01	BUTTON, S/S		32	A-7071-634-A	PJ-45P BOARD, COMPLETE (AEP, UK)	
8	3-718-233-01	NUT, PLATE		32	A-7071-676-A	PJ-45P BOARD, COMPLETE (Australian)	
9	3-946-260-01	HOLDER, STAND-BY KNOB		33	1-537-402-11	TERMINAL BOARD	
10	3-669-480-21	+ PTPWH 2		34	3-946-259-01	HOLDER, VK	
11	1-550-743-11	HOLDER, BATTERY		35	A-7071-632-A	VK-22P BOARD, COMPLETE (AEP, UK)	
12	3-946-194-01	LOCK, EJECT		35	A-7071-677-A	VK-22P BOARD, COMPLETE (Australian)	
13	3-570-896-00	SPRING, TENSION		36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
14	3-946-193-01	KNOB, REC (Australian)		37	A-7071-633-A	SW-200P BOARD, COMPLETE	
15	3-946-187-01	BUTTON, EDIT		38	3-946-185-01	HOLDER, SW	
16	3-946-261-01	BUTTON, INPUT OUTPUT (Australian)		* 39	3-946-225-01	REINFORCEMENT, PJ	
17	A-7091-784-A	CAP BLOCK ASSY, LENS		40	3-947-487-01	PLATE, GROUND, PJ	
18	X-3941-804-1	LID ASSY, CASSETTE		41	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
* 19	3-703-713-41	STICKER, SONY SYMBOL (10)		42	3-724-455-01	SCREW (M2X4)	
20	3-719-381-01	SCREW (M2X4)		* 43	1-693-017-11	REMOTE COMMANDER (CAM CODER) (RMT-509)	
21	X-3941-541-1	HOLDER ASSY, LITHIUM		44	3-947-500-01	LID, BATTERY CASE	
22	3-946-169-01	LID, JACK		W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
23	3-948-339-01	SCREW (BTP) (2X5), HEAD					
24	A-7063-246-A	MA-93P BOARD, COMPLETE					

5-2. CAB

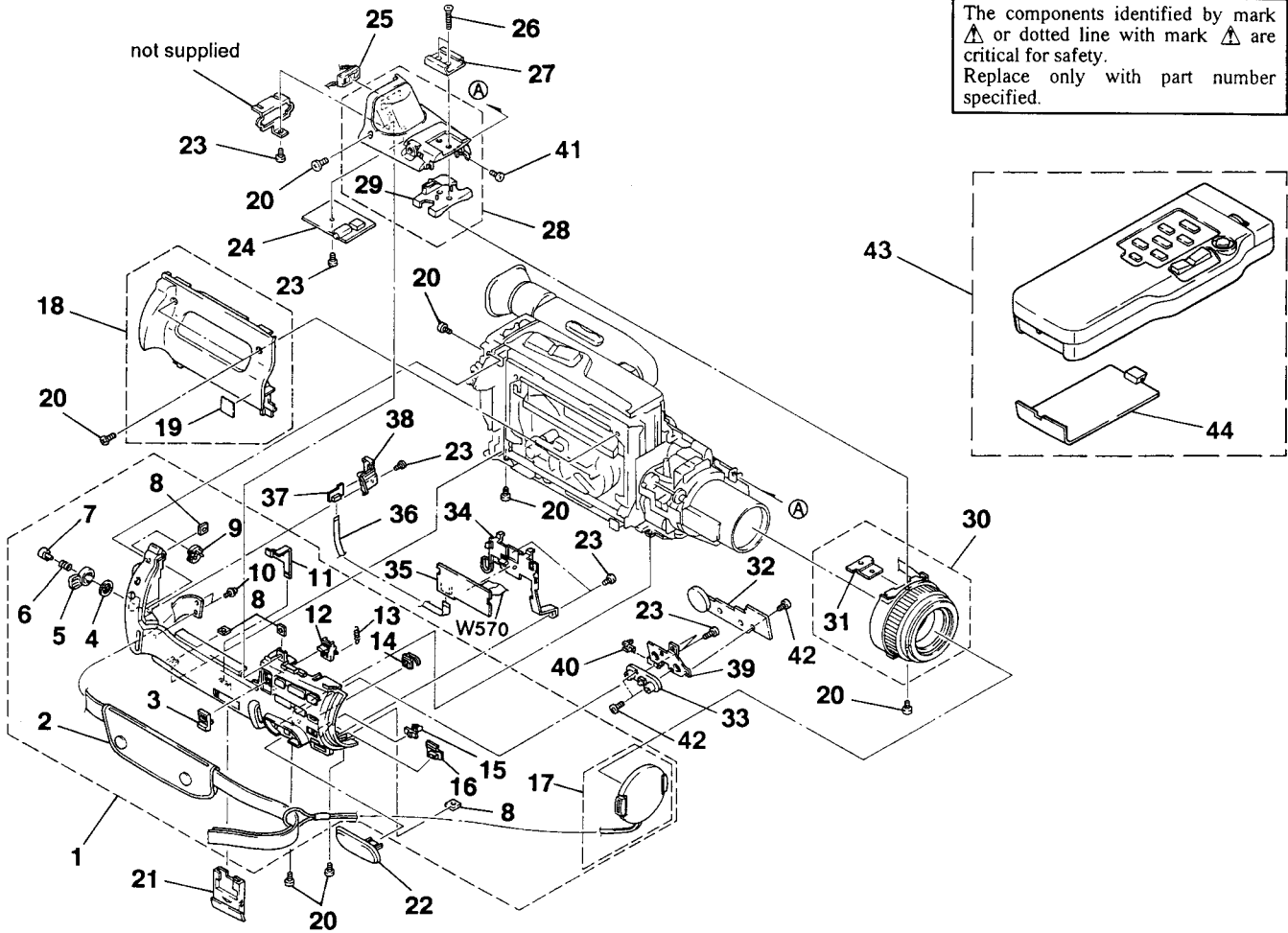


SECTION 5
EXPLODED VIEWS

NOTE:

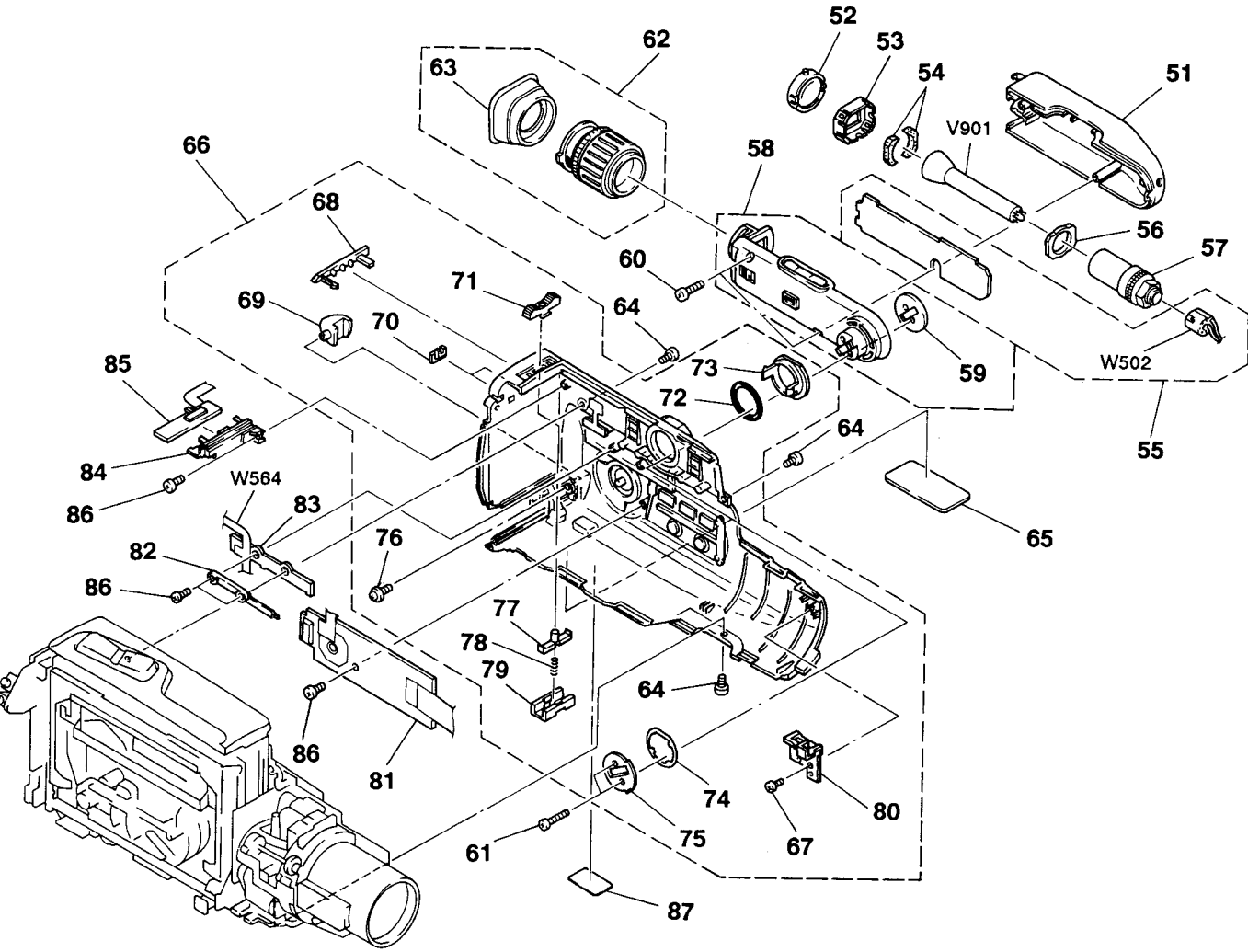
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

5-1. CABINET (UPPER), (L) ASSEMBLIES



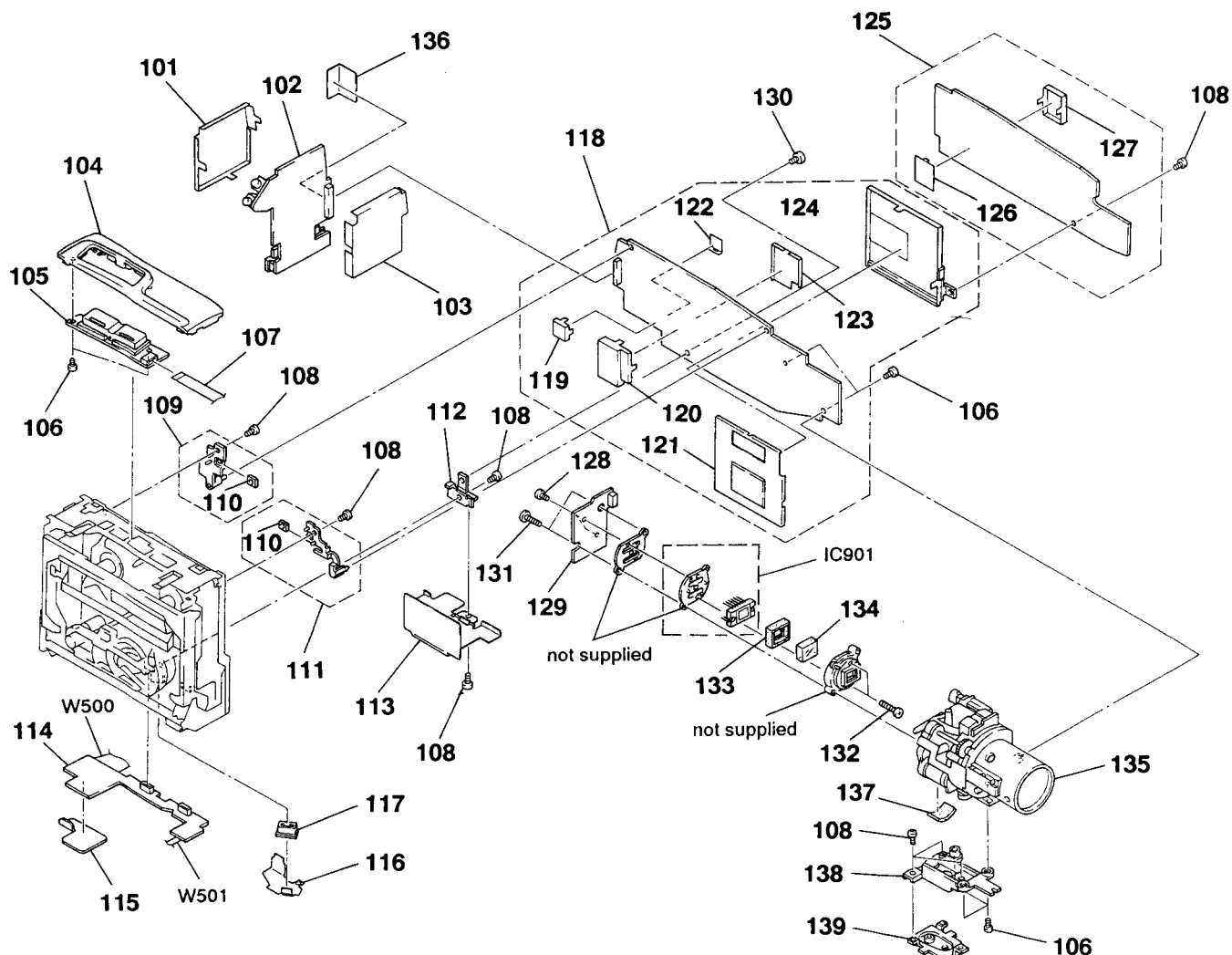
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	X-3941-789-1	CABINET (L) ASSY (AEP, UK)		25	1-542-126-41	MICROPHONE UNIT	
1	X-3941-955-1	CABINET (L) ASSY (Australian)		26	3-948-809-31	SCREW (M2X12)	
2	3-736-807-01	BELT, GRIP		27	3-724-511-01	SHOE, ACCESSORY	
3	3-946-195-01	BUTTON, EJECT		28	X-3941-321-1	CABINET (UPPER) ASSY	
4	3-736-364-01	SPRING		29	3-946-234-01	PRISM, REMOTE CONTROL	
5	3-942-985-01	KNOB, STAND-BY		30	1-241-771-11	RES. VAR (FOCUS RING)	
6	3-578-221-00	SPRING, COMPRESSION		31	3-946-172-01	SHEET METAL, SHOE	
7	3-736-343-01	BUTTON, S/S		32	A-7071-634-A	PJ-45P BOARD, COMPLETE (AEP, UK)	
8	3-718-233-01	NUT, PLATE		32	A-7071-676-A	PJ-45P BOARD, COMPLETE (Australian)	
9	3-946-260-01	HOLDER, STAND-BY KNOB		33	1-537-402-11	TERMINAL BOARD	
10	3-669-480-21	+ PTPWH 2		34	3-946-259-01	HOLDER, VK	
11	1-550-743-11	HOLDER, BATTERY		35	A-7071-632-A	VK-22P BOARD, COMPLETE (AEP, UK)	
12	3-946-194-01	LOCK, EJECT		35	A-7071-677-A	VK-22P BOARD, COMPLETE (Australian)	
13	3-570-896-00	SPRING, TENSION		36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
14	3-946-193-01	KNOB, REC (Australian)		37	A-7071-633-A	SW-200P BOARD, COMPLETE	
15	3-946-187-01	BUTTON, EDIT		38	3-946-185-01	HOLDER, SW	
16	3-946-261-01	BUTTON, INPUT OUTPUT (Australian)		* 39	3-946-225-01	REINFORCEMENT, PJ	
17	A-7091-784-A	CAP BLOCK ASSY, LENS		40	3-947-487-01	PLATE, GROUND, PJ	
18	X-3941-804-1	LID ASSY, CASSETTE		41	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
* 19	3-703-713-41	STICKER, SONY SYMBOL (10)		42	3-724-455-01	SCREW (M2X4)	
20	3-719-381-01	SCREW (M2X4)		* 43	1-693-017-11	REMOTE COMMANDER (CAM CODER) (RMT-509)	
21	X-3941-541-1	HOLDER ASSY, LITHIUM		44	3-947-500-01	LID, BATTERY CASE	
22	3-946-169-01	LID, JACK		W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
23	3-948-339-01	SCREW (BTP) (2X5), HEAD					
24	A-7063-246-A	MA-93P BOARD, COMPLETE					

5-2. CABINET (R), EVF ASSEMBLIES



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	X-3941-319-1	CABINET (R) ASSY, EVF		70	3-946-251-01	BUTTON, ON/OFF	
52	A-7081-905-A	LENS ASSY, VF		71	3-946-248-01	BUTTON, POWER	
53	3-946-203-01	HOLDER, CRT		72	3-946-253-01	RING, TILT	
54	3-946-205-01	PACKING, CRT		73	3-946-252-01	SLEEVE, EVF	
55	A-7063-129-A	VF-44P BOARD, COMPLETE		74	3-946-255-01	SPRING, LEAF, TILT	
56	3-946-204-01	COVER, CRT		75	3-946-254-01	PLATE, LOCK, TILT	
Δ 57	1-451-310-21	DEFLECTION YOKE (B/W)		76	3-669-480-21	+ PTPWH 2	
58	X-3941-318-1	CABINET (L) ASSY, EVF		77	3-946-186-01	PUSH BUTTON, POWER	
59	3-946-202-01	JOINT, EVF		78	3-303-973-00	SPRING, COMPRESSION	
60	3-713-790-31	SCREW (M2X8), TAPPING, P3		79	3-946-249-01	PLATE, FUNCTION, POWER	
61	3-740-546-51	SCREW (M2X9)		80	3-947-315-01	PLATE, FIXED, CABINET	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER		81	A-7071-637-A	CK-47P BOARD, COMPLETE	
63	3-946-212-01	EYE CUP		82	3-946-199-01	RETAINER, DK	
64	3-719-381-01	SCREW (M2X4)		83	A-7071-638-A	DK-20P BOARD, COMPLETE	
* 65	3-948-532-01	LABEL, MODEL NUMBER (AEP)		84	3-946-198-01	RETAINER, PK	
* 66	3-949-285-01	LABEL, MODEL NUMBER (UK, Australian)		85	A-7071-639-A	PK-30P BOARD, COMPLETE	
66	X-3941-662-1	CABINET (R) ASSY (Australian)		86	3-948-339-01	SCREW (BTP) (2X5), HEAD	
66	X-3941-788-1	CABINET (R) ASSY (AEP, UK)		* 87	3-704-235-01	LABEL, CAUTION (UK)	
67	3-713-790-01	SCREW (M2X5), TAPPING, P3		Δ V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
68	3-946-256-01	CAP, POWER		Δ W502	1-526-978-51	SOCKET ASSY, CRT	
69	3-946-246-01	BUTTON, BATTERY RELEASE		W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

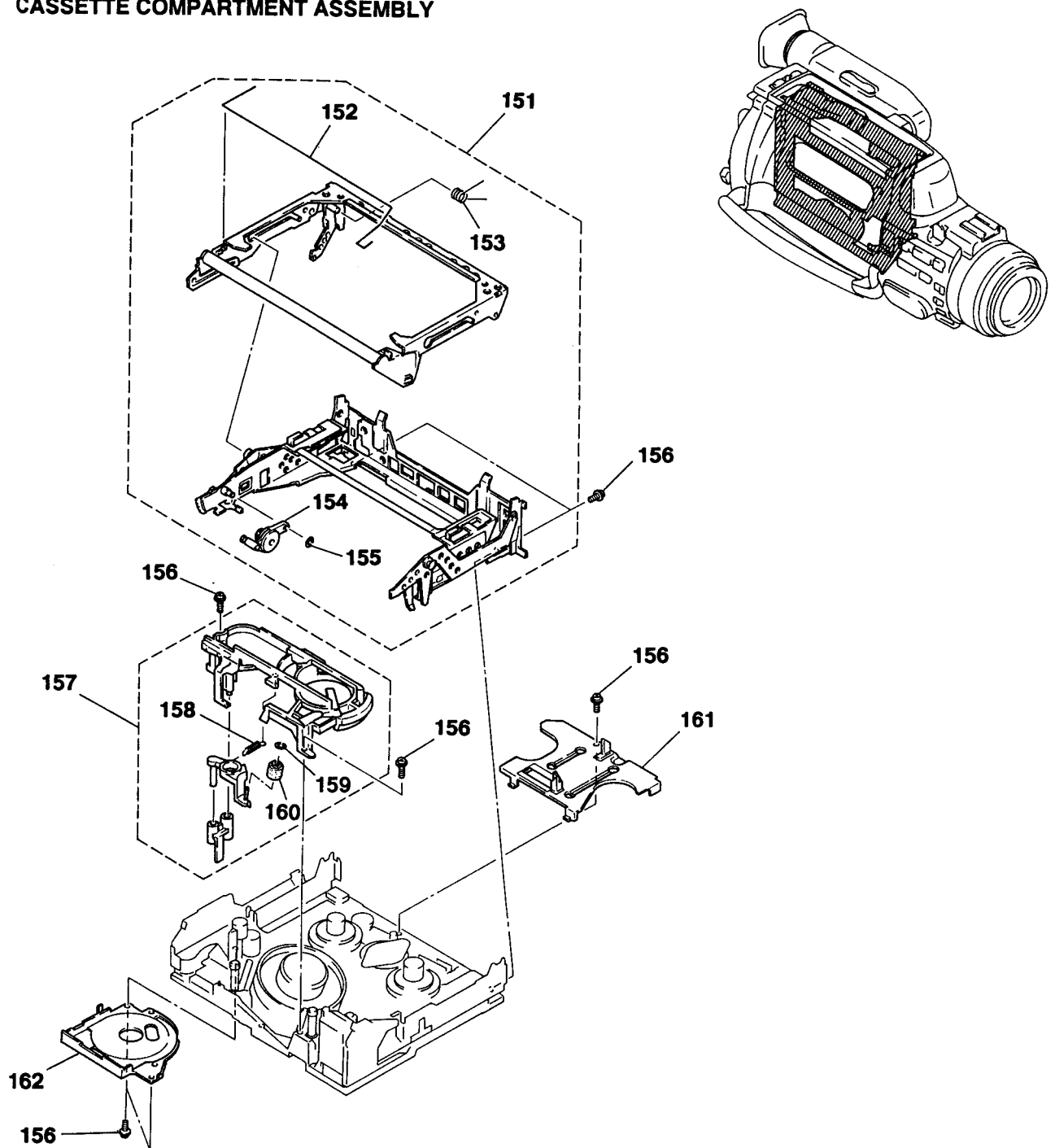
5-3. MAIN BOARD ASSEMBLY



Ref. No.	Part No.	Description
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS
102	A-7063-242-A	PS-282P BOARD, COMPLETE
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS
104	X-3941-320-1	LID ASSY, LS
105	1-692-025-11	SWITCH, PUSH
106	3-948-339-01	SCREW (BTP) (2X5), HEAD
107	1-643-555-11	FP-558 FLEXIBLE BOARD
108	3-719-381-01	SCREW (M2X4)
109	A-7081-889-A	HOLDER (R) ASSY, CS
110	3-718-233-01	NUT, PLATE
111	A-7081-888-A	HOLDER (F) ASSY, CS
112	3-946-175-01	HOLDER (B), CS
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM
114	A-7063-245-A	SL-22P BOARD, COMPLETE
* 115	3-947-660-01	INSULATOR, SL
116	1-642-187-11	FP-426 FLEXIBLE BOARD
117	1-691-471-11	CONNECTOR, TRANSLATION 11P
118	A-7063-243-A	CS-31P BOARD, COMPLETE
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE
* 120	3-946-177-01	CASE (MAIN), SHIELD, RP
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA
* 122	3-946-180-01	CASE (LID), SHIELD, FE

Ref. No.	Part No.	Description	Remark
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-244-A	VA-71P BOARD, COMPLETE (AEP, UK)	
125	A-7063-295-A	VA-71P BOARD, COMPLETE (Australian)	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-713-786-51	SCREW (M2X3)	
129	A-7063-241-A	CD-61P BOARD, COMPLETE	
130	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
131	3-747-151-21	SCREW (2X12)	
132	3-713-786-11	SCREW (M2X6)	
133	3-943-063-11	RUBBER, SEAL	
134	1-547-558-21	FILTER BLOCK, OPTICAL	
135	1-547-540-11	LENS, ZOOM (VCL-6110WA) (TYPE I)	
135	1-547-561-21	LENS, ZOOM (VCL-6110WC) (TYPE II)	
136	3-831-441-XX	CUSHION	
137	3-947-630-01	SHEET, ZOOM RUBBER	
138	3-946-223-01	HOLDER (C), LENS	
139	3-946-224-01	SHEET METAL, TRIPOD	
IC901	A-7030-340-A	CCD ASSY (AUTO) (CCD IMAGER)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

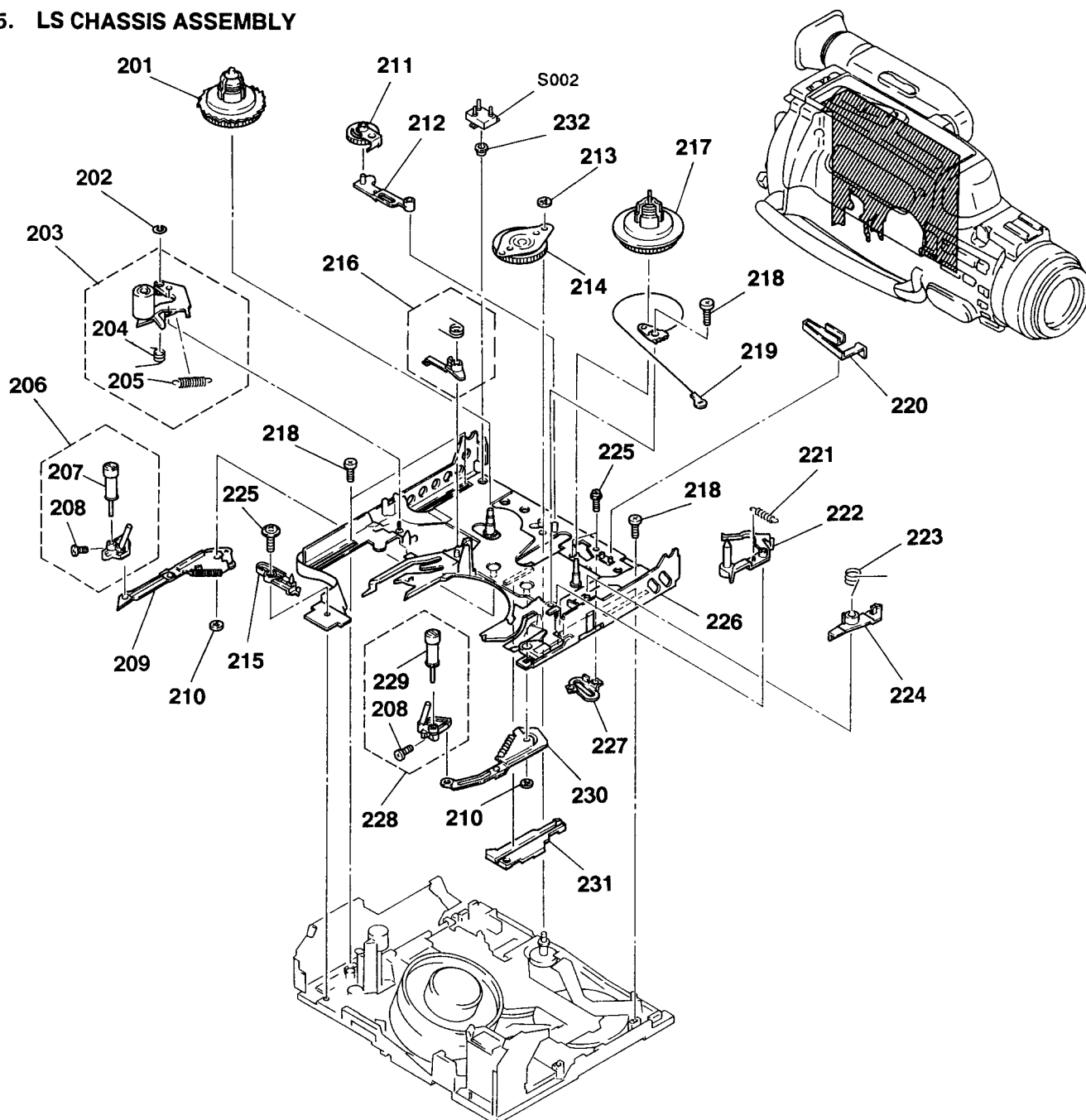
5-4. CASSETTE COMPARTMENT ASSEMBLY



Ref. No.	Part No.	Description
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCK ASSY
152	3-945-773-01	BAR, TORSION
153	3-945-771-01	SPRING, TORSION
154	X-3941-287-2	DAMPER ASSY
155	3-315-384-31	WASHER, STOPPER
156	3-947-503-01	SCREW (M1.4X2.5)

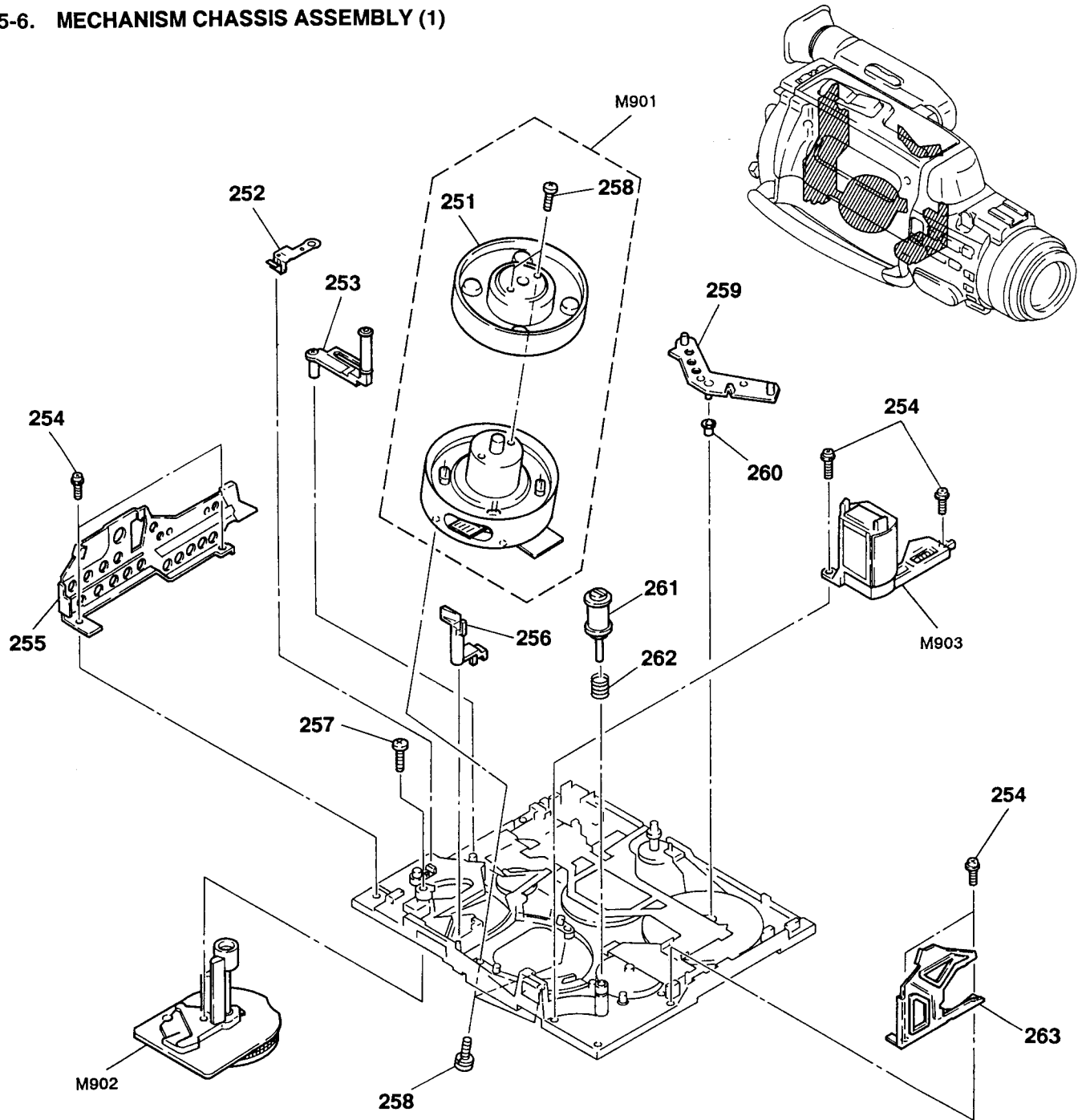
Ref. No.	Part No.	Description
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY
158	3-945-760-01	SPRING, TENSION
159	3-321-393-01	WASHER, STOPPER
160	X-3726-817-3	ROLLER ASSY, HC
161	X-3941-280-1	RETAINER ASSY, GOOSENECK
162	3-945-733-01	COVER, CAPSTAN

5-5. LS CHASSIS ASSEMBLY



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T		218	3-945-756-01	SCREW (M1.4X3)	
202	3-331-007-21	WASHER		219	X-3941-277-1	STRING BLOCK ASSY	
203	X-3941-271-1	ARM ASSY, PINCH		220	3-945-801-01	BRAKE, S SOFT	
204	3-945-743-01	SPRING, TORSION					
205	3-945-783-01	SPRING, TENSION		221	3-948-810-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY		222	X-3941-276-1	TG1 ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6		223	3-945-752-01	SPRING, TORSION	
208	3-947-504-01	SCREW (M1.2X2)		224	3-945-799-01	BRAKE, S HARD	
209	X-3941-267-1	ARM (T) ASSY, GUIDE		225	3-947-503-01	SCREW (M1.4X2.5)	
210	3-669-465-00	WASHER (1.5), STOPPER		226	X-3941-265-1	CHASSIS ASSY, LS	
211	X-3941-273-1	SOFT ASSY, T		227	3-945-784-01	PLATE, CAM, LS	
212	3-945-753-01	ARM, T SOFT		228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
213	3-726-829-01	WASHER, STOPPER		229	X-3942-129-1	ROLLER ASSY (SUS), TG3	
214	X-3941-279-1	GEAR ASSY, GOOSENECK		230	X-3941-266-1	ARM (S) ASSY, GUIDE	
215	3-947-644-01	RETAINER, TG5 (BASE)		231	3-945-837-01	SLIDER, GL	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD		232	3-949-881-01	SLEEVE	
217	X-3941-275-1	TABLE ASSY, REEL, S		S002	1-572-987-11	SWITCH, PUSH (3KEY) (REC PROOF, ME/MP, MP/MP-HG)	

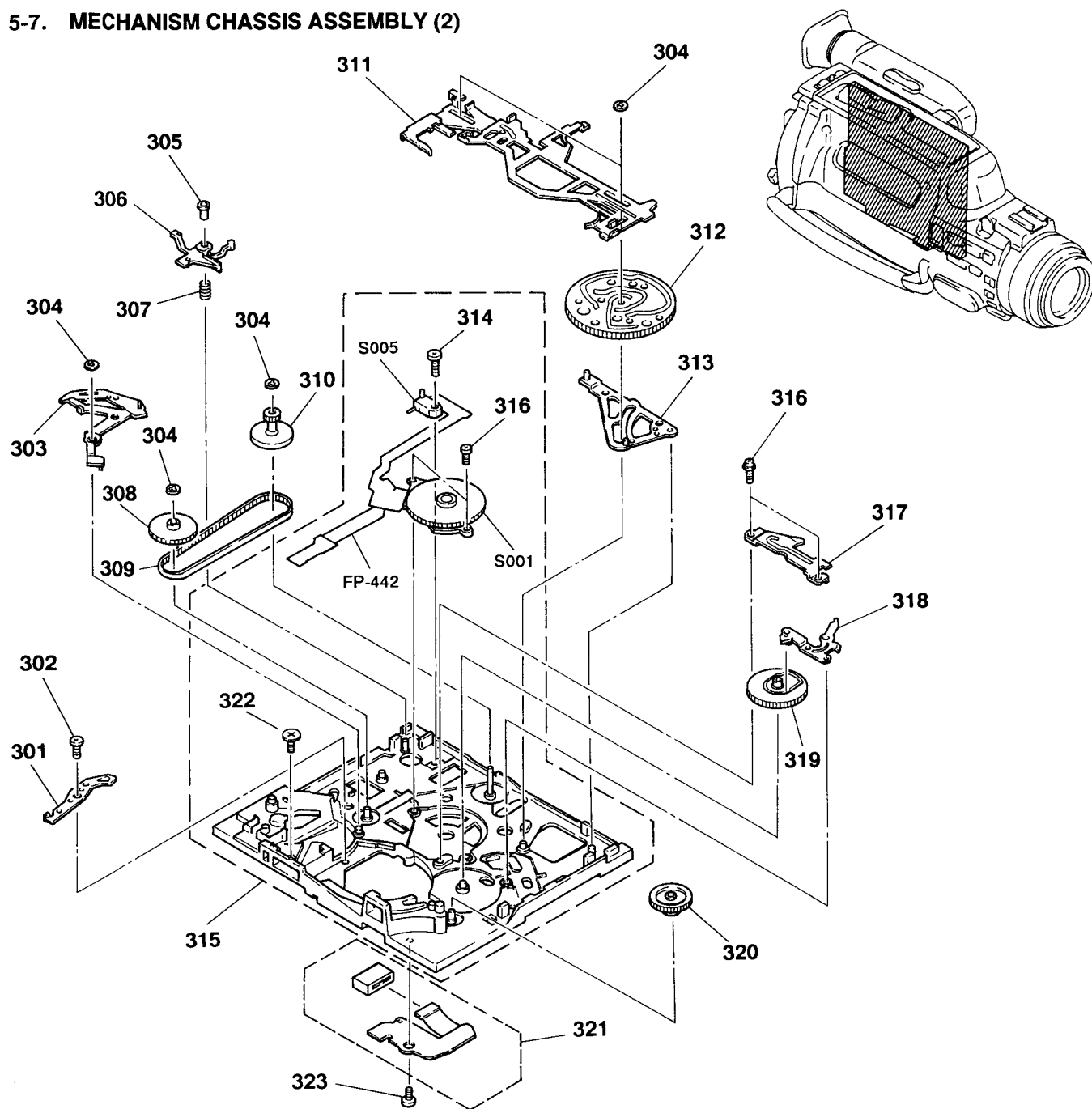
5-6. MECHANISM CHASSIS ASSEMBLY (1)



Ref. No.	Part No.	Description
251	A-7049-521-A	DRUM ASSY, UPPER (DGR-90-R)
252	3-945-822-01	SPRING, LEAF, TG7 ARM
253	A-7040-305-A	ARM BLOCK ASSY, TG7
254	3-947-503-01	SCREW (M1.4X2.5)
255	X-3941-255-1	PLATE (T) ASSY, SIDE
256	3-945-735-01	ARM, HC CONVERSION
257	3-713-786-71	SCREW (M2X5)
258	3-686-493-01	SCREW (M2X5), P1
259	3-945-701-01	ARM, LS

Ref. No.	Part No.	Description	Remark
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

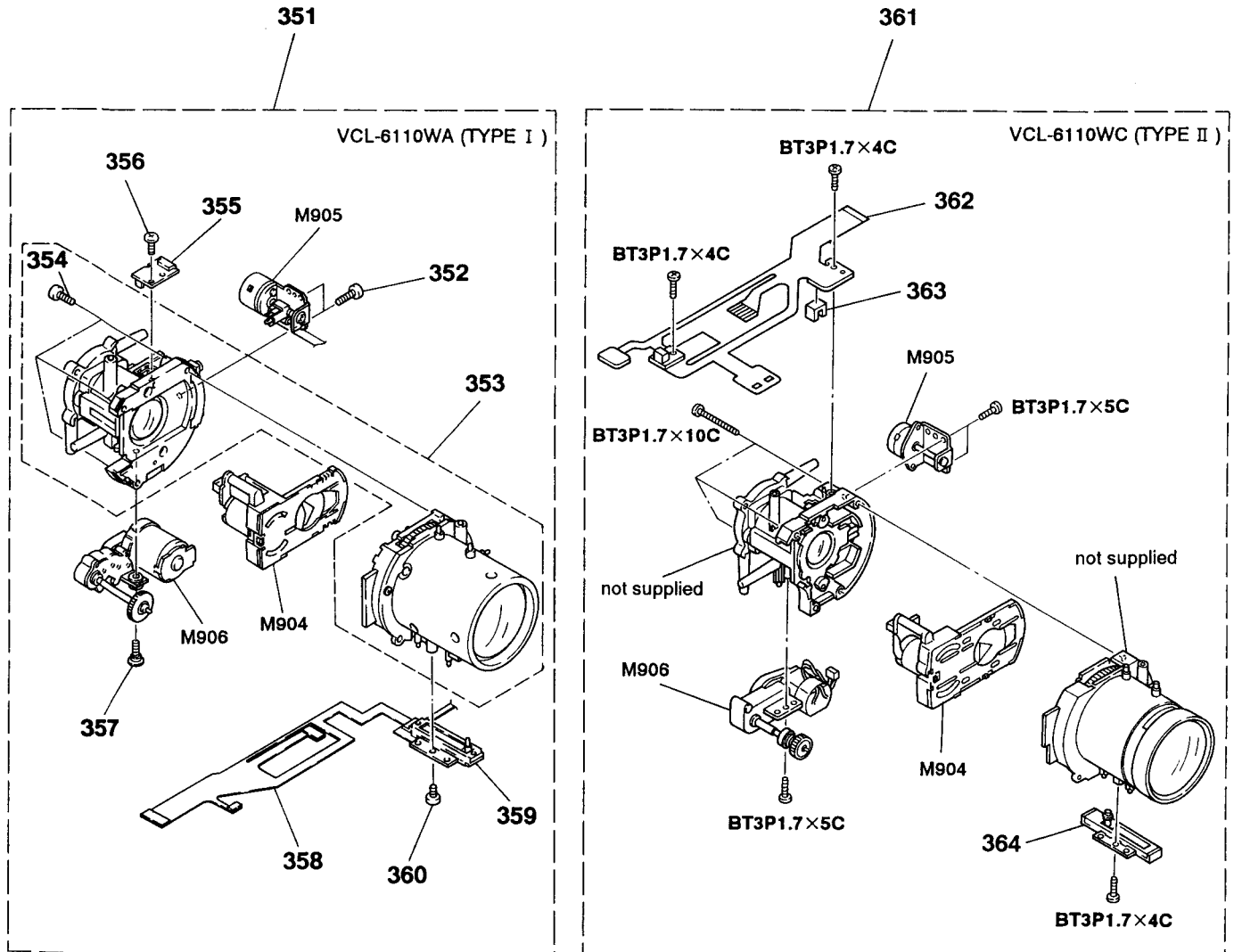
5-7. MECHANISM CHASSIS ASSEMBLY (2)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING		314	3-713-786-71	SCREW (M2X5)	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD		315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
303	X-3941-259-1	ARM ASSY, PINCH PRESS		316	3-947-503-01	SCREW (M1.4X2.5)	
304	3-726-829-01	WASHER, STOPPER		317	3-945-722-01	RETAINER, GEAR	
305	3-945-730-01	SLEEVE, EJECT		318	X-3941-257-1	ARM ASSY, FF	
306	3-945-706-01	LEVER, EJECT		319	3-945-697-01	GEAR (B), L	
307	3-945-729-01	SPRING, COMPRESSION		320	3-945-700-01	GEAR (A), L	
308	X-3941-256-1	GEAR ASSY, CHANGE		321	A-7040-311-A	FP-444 ASSY	
309	3-944-539-01	BELT, RELAY		322	3-946-848-01	SCREW, TG6 ADJUSTMENT	
310	3-945-695-01	PULLEY, RELAY		323	3-945-756-01	SCREW (M1.4X3)	
311	X-3941-260-1	SLIDER ASSY, M		S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
312	3-945-696-01	CAM		S005	1-570-771-21	SWITCH (C DOWN)	
313	X-3941-258-1	ARM ASSY, GL					

5-8. ZOOM LENS ASSEMBLY (VCL-6110WA), (VCL-6110WC)

(Distinguishing TYPE I (VCL-6110WA) from TYPE II (VCL-6110WC)
The sensor board attached to the flexible board (Ref. No. 358 or No. 362) or TYPE I (VCL-6110WA) can be removed with a connector (Ref. No. 355) while that of TYPE II (VCL-6110WC) cannot.



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
351	1-547-540-11	LENS, ZOOM (VCL-6110WA) (TYPE I)		361	1-547-561-21	LENS, ZOOM (VCL-6110WC) (TYPE II)	
352	3-708-390-01	SCREW, FITTING, FOCUS MOTOR (TYPE I)		362	3-708-488-01	P. C. B ASSY, MAIN (TYPE II)	
353	3-708-384-01	LENS ASSY (TYPE I)		363	3-708-490-01	PHOTO INTERRUPTER (FOCUS END) (TYPE II)	
354	3-708-386-01	SCREW, DOCKING (TYPE I)		364	3-708-485-01	ENCORDER, ZOOM (TYPE II)	
355	3-708-331-01	SENSOR ASSY, RESET (TYPE I)		M904	3-708-385-01	IRIS ASSY (TYPE I)	
356	3-708-392-01	SCREW, FITTING, FI BOARD (TYPE I)		M904	3-708-486-01	METER ASSY, IG (IRIS) (TYPE II)	
357	3-707-501-01	SCREW, (Z) MOTOR FITTING (TYPE I)		M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
358	3-708-395-01	CHASSIS, RELAY FLEXIBLE (TYPE I)		M905	3-708-489-01	MOTOR ASSY, AF (FOCUS) (TYPE II)	
359	3-708-393-01	POTENTIAL, ZOOM (FOCUS END) (TYPE I)		M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	
360	3-708-394-01	SCREW, FITTING, ZOOM POTENTIAL (TYPE I)		M906	3-708-487-01	MOTOR ASSY, PZ (ZOOM) (TYPE II)	

SECTION 6 ELECTRICAL PARTS LIST

CD-61

CK-47

NOTE:

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- Hardware (# mark) list is given in the last of this parts list.

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA...,
uPB...: μ PB..., uPC...: μ PC...,
uPD...: μ PD...
- CAPACITORS
uF: μ F
- COILS
uH: μ H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-7063-241-A	CD-61 BOARD, COMPLETE ***** (Ref, No 1,000 Series)		R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
		< CAPACITOR >		R910	1-216-809-11	METAL CHIP 100 5% 1/16W	
C901	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V		R911	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
C902	1-128-013-11	ELECT CHIP 1uF 20% 50V		R914	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
C903	1-128-008-11	ELECT CHIP 3.3uF 20% 35V		R915	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
C904	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V		R916	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
C905	1-162-637-11	CERAMIC CHIP 0.47uF 16V		R917	1-216-821-11	METAL CHIP 1K 5% 1/16W	
		< CAPACITOR >		R918	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
C906	1-126-607-11	ELECT CHIP 47uF 20% 4V		*****			
C907	1-128-004-11	ELECT CHIP 10uF 20% 16V		*	A-7071-637-A	CK-47 BOARD, COMPLETE ***** (Ref, No 6,000 Series)	
C908	1-128-007-11	ELECT CHIP 2.2uF 20% 35V				< CAPACITOR >	
C909	1-162-974-11	CERAMIC CHIP 0.01uF 50V		C561	1-164-506-11	CERAMIC CHIP 4.7uF 16V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V				< CONNECTOR >	
C911	1-164-156-11	CERAMIC CHIP 0.1uF 25V		* CN562	1-580-756-21	PIN, CONNECTOR 7P	
		< CONNECTOR >				< DIODE >	
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P		D560	8-719-820-05	DIODE 1SS181	
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P		D561	8-719-404-46	DIODE MA110	
		< DIODE >		D562	8-719-110-03	DIODE RD7. 5ES-B2	
D901	8-719-820-05	DIODE 1SS181		D563	8-719-110-03	DIODE RD7. 5ES-B2	
D903	8-719-820-05	DIODE 1SS181		D564	8-719-110-03	DIODE RD7. 5ES-B2	
D904	8-719-800-76	DIODE 1SS226		D565	8-719-110-03	DIODE RD7. 5ES-B2	
		< COIL >				< COIL >	
L901	1-412-032-11	INDUCTOR CHIP 100uH		L560	1-412-028-11	INDUCTOR CHIP 4.7uH	
		< TRANSISTOR >				< SWITCH >	
Q901	8-729-602-21	TRANSISTOR 2SC4154-F		S560	1-692-024-11	SWITCH, ROTARY (PROGRAM AE)	
Q902	8-729-402-13	TRANSISTOR XN1501		S564	1-572-938-21	SWITCH, TACTIL (DATE)	
Q903	8-729-232-86	TRANSISTOR 2SK1875		S565	1-572-938-21	SWITCH, TACTIL (TIME)	
		< RESISTOR >		S566	1-572-938-21	SWITCH, TACTIL (EVENT)	
R901	1-216-845-11	METAL CHIP 100K 5% 1/16W		S567	1-692-111-11	SWITCH, KEY BOARD (BACK LIGHT)	
R902	1-216-857-11	METAL CHIP 1M 5% 1/16W		S568	1-692-111-11	SWITCH, KEY BOARD (FADER)	
R903	1-216-819-11	METAL CHIP 680 5% 1/16W				< FLAT CABLE >	
R904	1-216-843-11	METAL CHIP 68K 5% 1/16W		W561	1-690-602-11	CABLE, FLAT (FFC-23) 16P	
R905	1-216-849-11	METAL CHIP 220K 5% 1/16W					
R906	1-216-839-11	METAL CHIP 33K 5% 1/16W					
R907	1-216-835-11	METAL CHIP 15K 5% 1/16W					
R908	1-216-850-11	METAL CHIP 270K 5% 1/16W					

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*****				C508	1-162-995-11	CERAMIC CHIP 0.022uF	50V
*	A-7063-243-A	CS-31 BOARD, COMPLETE		C509	1-128-004-11	ELECT CHIP 10uF	20% 16V
		*****		C510	1-162-995-11	CERAMIC CHIP 0.022uF	50V
		(Ref, No 3,000 Series)		C511	1-162-974-11	CERAMIC CHIP 0.01uF	50V
	X-3941-498-1	CASE (LID), SHIELD, CAMERA		C512	1-164-173-11	CERAMIC CHIP 0.0039uF	10% 50V
*	3-946-177-01	CASE (MAIN), SHIELD, RP		C513	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
*	3-946-178-01	CASE (LID), SHIELD, RP		C514	1-162-995-11	CERAMIC CHIP 0.022uF	50V
*	3-946-179-01	CASE (MAIN), SHIELD, FE		C515	1-128-004-11	ELECT CHIP 10uF	20% 16V
*	3-946-180-01	CASE (LID), SHIELD, FE		C517	1-128-004-11	ELECT CHIP 10uF	20% 16V
		< CAPACITOR >		C518	1-162-995-11	CERAMIC CHIP 0.022uF	50V
C001	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C519	1-128-004-11	ELECT CHIP 10uF	20% 16V
C002	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C520	1-164-489-11	CERAMIC CHIP 0.22uF	10% 16V
C003	1-128-004-11	ELECT CHIP 10uF	20% 16V	C521	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C004	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C522	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C005	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C523	1-162-965-11	CERAMIC CHIP 0.0015uF	10% 50V
C006	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C524	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C007	1-128-004-11	ELECT CHIP 10uF	20% 16V	C525	1-164-227-11	CERAMIC CHIP 0.022uF	10% 25V
C008	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C526	1-162-995-11	CERAMIC CHIP 0.022uF	50V
C009	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C527	1-163-035-00	CERAMIC CHIP 0.047uF	50V
C010	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C528	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C011	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C529	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C012	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C530	1-162-918-11	CERAMIC CHIP 18PF	5% 50V
C013	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C531	1-162-917-11	CERAMIC CHIP 15PF	5% 50V
C014	1-128-004-11	ELECT CHIP 10uF	20% 16V	C532	1-162-905-11	CERAMIC CHIP 1PF	0.25PF50V
C016	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C534	1-162-995-11	CERAMIC CHIP 0.022uF	50V
C017	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C535	1-128-004-11	ELECT CHIP 10uF	20% 16V
C018	1-128-004-11	ELECT CHIP 10uF	20% 16V	C536	1-128-004-11	ELECT CHIP 10uF	20% 16V
C019	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C538	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C020	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C540	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C021	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C541	1-126-204-11	ELECT CHIP 47uF	20% 16V
C022	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C542	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C023	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C543	1-164-107-11	CERAMIC CHIP 0.15uF	10% 16V
C024	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C544	1-164-107-11	CERAMIC CHIP 0.15uF	10% 16V
C025	1-128-004-11	ELECT CHIP 10uF	20% 16V	C546	1-128-008-11	ELECT CHIP 3.3uF	20% 35V
C026	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C547	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V
C028	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C548	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V
C041	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V	C549	1-162-967-11	CERAMIC CHIP 0.0033uF	10% 50V
C042	1-162-953-11	CERAMIC CHIP 100PF	5% 50V	C550	1-162-967-11	CERAMIC CHIP 0.0033uF	10% 50V
C043	1-162-927-11	CERAMIC CHIP 100PF	5% 50V	C551	1-162-967-11	CERAMIC CHIP 0.0033uF	10% 50V
C044	1-162-927-11	CERAMIC CHIP 100PF	5% 50V	C552	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C045	1-164-217-11	CERAMIC CHIP 150PF	5% 50V	C553	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C046	1-164-156-11	CERAMIC CHIP 0.1uF	25V	C554	1-164-222-11	CERAMIC CHIP 0.22uF	25V
C501	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C555	1-164-222-11	CERAMIC CHIP 0.22uF	25V
C502	1-162-974-11	CERAMIC CHIP 0.01uF	50V	C556	1-162-995-11	CERAMIC CHIP 0.022uF	50V
C503	1-162-995-11	CERAMIC CHIP 0.022uF	50V	C558	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C504	1-162-995-11	CERAMIC CHIP 0.022uF	50V	C559	1-126-204-11	ELECT CHIP 47uF	20% 16V
C505	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V	C560	1-128-004-11	ELECT CHIP 10uF	20% 16V
C506	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V	C561	1-162-995-11	CERAMIC CHIP 0.022uF	50V
C507	1-162-995-11	CERAMIC CHIP 0.022uF	50V	C562	1-162-995-11	CERAMIC CHIP 0.022uF	50V
				C563	1-162-971-11	CERAMIC CHIP 0.001uF	50V

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C564	1-162-920-11	CERAMIC CHIP 27PF	5%	50V		C726	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C565	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C729	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C566	1-162-917-11	CERAMIC CHIP 15PF	5%	50V		C731	1-135-259-11	TANTAL. CHIP 10uF	20%	6.3V	
C567	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C733	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C568	1-128-006-11	ELECT CHIP 4.7uF	20%	25V		C734	1-135-259-11	TANTAL. CHIP 10uF	20%	6.3V	
C569	1-164-337-11	CERAMIC CHIP 2.2uF		16V		C736	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C570	1-162-962-11	CERAMIC CHIP 470PF	10%	50V		C737	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V	
C571	1-162-961-11	CERAMIC CHIP 330PF	10%	50V		C738	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C572	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C739	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C573	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C741	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C574	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V		C743	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C575	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C745	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C576	1-128-004-11	ELECT CHIP 10uF	20%	16V		C749	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V	
C577	1-162-927-11	CERAMIC CHIP 100PF	5%	50V		C751	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C578	1-164-222-11	CERAMIC CHIP 0.22uF		25V		C752	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C579	1-128-004-11	ELECT CHIP 10uF	20%	16V		C753	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C580	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C754	1-162-943-11	CERAMIC CHIP 15PF	5%	50V	
C582	1-162-964-11	CERAMIC CHIP 0.001uF	10%	50V		C756	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C583	1-128-004-11	ELECT CHIP 10uF	20%	16V		C757	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C584	1-128-004-11	ELECT CHIP 10uF	20%	16V		C801	1-135-259-11	TANTAL. CHIP 10uF	20%	6.3V	
C586	1-162-918-11	CERAMIC CHIP 18PF	5%	50V		C802	1-162-917-11	CERAMIC CHIP 15PF	5%	50V	
C587	1-162-921-11	CERAMIC CHIP 33PF	5%	50V		C803	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V	
C588	1-162-964-11	CERAMIC CHIP 0.001uF	10%	50V		C804	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C589	1-164-633-11	CERAMIC CHIP 0.1uF	10%	25V		C805	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C590	1-162-964-11	CERAMIC CHIP 0.001uF	10%	50V		C806	1-162-964-11	CERAMIC CHIP 0.001uF	10%	50V	
C591	1-162-969-11	CERAMIC CHIP 0.0068uF	10%	25V		C807	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C592	1-162-969-11	CERAMIC CHIP 0.0068uF	10%	25V		C808	1-135-091-00	TANTALUM CHIP 1uF	20%	16V	
C593	1-163-809-11	CERAMIC CHIP 0.047uF	10%	25V		C809	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V	
C594	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V		C810	1-163-077-00	CERAMIC CHIP 0.1uF	10%	25V	
C595	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C811	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C701	1-135-149-21	TANTALUM CHIP 2.2uF	20%	10V		C813	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C702	1-164-004-11	CERAMIC CHIP 0.1uF	10%	25V		C814	1-162-964-11	CERAMIC CHIP 0.001uF	10%	50V	
C703	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C815	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V	
C705	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C816	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C706	1-164-004-11	CERAMIC CHIP 0.1uF	10%	25V		C817	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C707	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C818	1-135-091-00	TANTALUM CHIP 1uF	20%	16V	
C708	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C819	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C709	1-164-346-11	CERAMIC CHIP 1uF		16V		C820	1-135-091-00	TANTALUM CHIP 1uF	20%	16V	
C710	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C821	1-162-947-11	CERAMIC CHIP 33PF	5%	50V	
C711	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V		C823	1-135-091-00	TANTALUM CHIP 1uF	20%	16V	
C712	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C826	1-164-156-11	CERAMIC CHIP 0.1uF	25V		
C713	1-163-077-00	CERAMIC CHIP 0.1uF	10%	25V		C828	1-163-077-00	CERAMIC CHIP 0.1uF	10%	25V	
C714	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C831	1-163-077-00	CERAMIC CHIP 0.1uF	10%	25V	
C717	1-135-259-11	TANTAL. CHIP 10uF	20%	6.3V		C832	1-162-964-11	CERAMIC CHIP 0.001uF	10%	50V	
C718	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C833	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C719	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C834	1-163-077-00	CERAMIC CHIP 0.1uF	10%	25V	
C721	1-164-156-11	CERAMIC CHIP 0.1uF		25V		C835	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C722	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C836	1-126-205-11	ELECT CHIP 47uF	20%	6.3V	
C724	1-162-974-11	CERAMIC CHIP 0.01uF		50V		C837	1-162-974-11	CERAMIC CHIP 0.01uF	50V		
C725	1-135-181-21	TANTALUM CHIP 4.7uF	20%	6.3V		C838	1-135-145-11	TANTALUM CHIP 0.47uF	10%	35V	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C839	1-162-974-11	CERAMIC CHIP 0.01uF	50V			(FILTER)	
C840	1-164-337-11	CERAMIC CHIP 2.2uF	16V	FL701	1-402-713-21	COIL, OSC (PAL)	
C851	1-164-004-11	CERAMIC CHIP 0.1uF	10% 25V			(IC)	
C852	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V	IC001	8-752-058-14	IC CXA1202R	
C853	1-162-638-11	CERAMIC CHIP 1uF	16V	IC501	8-759-058-96	IC TB1206F	
C854	1-162-974-11	CERAMIC CHIP 0.01uF	50V	IC502	8-759-999-02	IC TL1596CDB	
C855	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC503	8-752-838-46	IC CXP80624-410Q	
C856	1-162-974-11	CERAMIC CHIP 0.01uF	50V	IC505	8-759-990-55	IC CXA8006M	
C857	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC506	8-759-088-92	IC uPD75316GF-303-3B9	
C858	1-162-974-11	CERAMIC CHIP 0.01uF	50V	IC507	8-759-511-22	IC CXA1448N	
C859	1-128-004-11	ELECT CHIP 10uF	20% 16V	IC508	8-759-512-69	IC S-81350HG-KD	
C861	1-162-974-11	CERAMIC CHIP 0.01uF	50V	IC509	8-759-145-63	IC uPD7564G-540	
C862	1-162-974-11	CERAMIC CHIP 0.01uF	50V	IC510	8-759-039-01	IC MPC1720M	
C863	1-162-974-11	CERAMIC CHIP 0.01uF	50V	IC511	8-759-044-78	IC AK6420F	
C864	1-162-638-11	CERAMIC CHIP 1uF	16V	IC701	8-759-031-58	IC SCTSU04F	
C865	1-126-205-11	ELECT CHIP 47uF	20% 6.3V	IC702	8-759-635-27	IC M62352GP	
C866	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC703	8-759-069-29	IC uPD6456GS-618	
C868	1-164-156-11	CERAMIC CHIP 0.1uF	25V	IC704	8-752-348-92	IC CXD2101AR	
C869	1-164-005-11	CERAMIC CHIP 0.47uF	25V	IC705	8-759-063-18	IC CXD2103AR	
C870	1-164-173-11	CERAMIC CHIP 0.0039uF	10% 50V	IC706	8-752-337-36	IC CXD2104N	
C872	1-162-638-11	CERAMIC CHIP 1uF	16V	IC707	8-752-337-32	IC CXD2100Q	
C875	1-135-259-11	TANTAL. CHIP 10uF	20% 6.3V	IC709	8-752-837-59	IC CXP80624-299Q	
		(CONNECTOR)		IC712	8-759-044-78	IC AK6420F	
CN001	1-569-775-21	PIN, CONNECTOR 5P		IC801	8-752-337-34	IC CXD1257R	
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P		IC802	8-752-056-39	IC CXA1507BR	
CN501	1-691-520-11	CONNECTOR, BOARD TO BOARD 48P		IC803	8-752-053-26	IC CXA1399Q	
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P		IC804	8-752-327-48	IC CXD1250N	
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P		IC805	8-752-054-61	IC CXA1390AR	
CN504	1-691-524-11	CONNECTOR, BOARD TO BOARD 20P		IC851	8-759-981-82	IC RC3414M	
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P		IC852	8-759-998-96	IC LM324D	
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P		IC853	8-759-038-81	IC MPC1724M	
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P		IC854	8-759-823-51	IC LB1830M	
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P		IC855	8-759-998-98	IC LM358D	
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P				(COIL)	
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P		L001	1-412-033-11	INDUCTOR CHIP 220uH	
		(TRIMMER)		L002	1-412-033-11	INDUCTOR CHIP 220uH	
CT801	1-141-356-11	CAP, ADJ 6PF		L003	1-412-033-11	INDUCTOR CHIP 220uH	
		(DIODE)		L004	1-412-029-11	INDUCTOR CHIP 10uH	
△D501	8-719-421-27	DIODE MA728		L041	1-412-033-11	INDUCTOR CHIP 220uH	
D502	8-719-404-46	DIODE MA110		L042	1-410-381-11	INDUCTOR CHIP 10uH	
D503	8-719-977-34	DIODE DTZ12		L501	1-412-029-11	INDUCTOR CHIP 10uH	
D504	8-719-941-86	DIODE DAN202U		L502	1-412-029-11	INDUCTOR CHIP 10uH	
D505	8-719-422-07	DIODE MA8082		L503	1-412-028-11	INDUCTOR CHIP 4.7uH	
D506	8-719-422-07	DIODE MA8082		L504	1-412-028-11	INDUCTOR CHIP 4.7uH	
D507	8-719-404-46	DIODE MA110		L506	1-412-029-11	INDUCTOR CHIP 10uH	
				L701	1-412-006-31	INDUCTOR CHIP 10uH	
				L702	1-412-006-31	INDUCTOR CHIP 10uH	
				L703	1-412-006-31	INDUCTOR CHIP 10uH	

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
L704	1-412-006-31	INDUCTOR CHIP 10uH		< RESISTOR >			
L706	1-412-029-11	INDUCTOR CHIP 10uH		R001	1-216-823-11	METAL CHIP 1.5K 5%	1/16W
L714	1-412-011-31	INDUCTOR CHIP 27uH		R003	1-216-837-11	METAL CHIP 22K 5%	1/16W
L715	1-412-029-11	INDUCTOR CHIP 10uH		R004	1-216-838-11	METAL CHIP 27K 5%	1/16W
L716	1-412-026-11	INDUCTOR CHIP 1uH		R005	1-216-835-11	METAL CHIP 15K 5%	1/16W
L717	1-412-029-11	INDUCTOR CHIP 10uH		R006	1-216-791-11	METAL CHIP 3.3 5%	1/16W
L719	1-412-006-31	INDUCTOR CHIP 10uH		R007	1-216-838-11	METAL CHIP 27K 5%	1/16W
L722	1-412-006-31	INDUCTOR CHIP 10uH		R008	1-216-838-11	METAL CHIP 27K 5%	1/16W
L723	1-410-391-11	INDUCTOR CHIP 68uH		R009	1-216-841-11	METAL CHIP 47K 5%	1/16W
L730	1-412-026-11	INDUCTOR CHIP 1uH		R011	1-216-838-11	METAL CHIP 27K 5%	1/16W
L731	1-412-026-11	INDUCTOR CHIP 1uH		R012	1-216-837-11	METAL CHIP 22K 5%	1/16W
L732	1-412-026-11	INDUCTOR CHIP 1uH		R013	1-216-823-11	METAL CHIP 1.5K 5%	1/16W
L733	1-412-979-21	INDUCTOR 1uH		R014	1-216-791-11	METAL CHIP 3.3 5%	1/16W
L734	1-412-979-21	INDUCTOR 1uH		R015	1-216-841-11	METAL CHIP 47K 5%	1/16W
L801	1-412-029-11	INDUCTOR CHIP 10uH		R016	1-216-832-11	METAL CHIP 8.2K 5%	1/16W
L802	1-412-006-31	INDUCTOR CHIP 10uH		R017	1-216-837-11	METAL CHIP 22K 5%	1/16W
L803	1-412-029-11	INDUCTOR CHIP 10uH		R018	1-216-832-11	METAL CHIP 8.2K 5%	1/16W
L804	1-412-029-11	INDUCTOR CHIP 10uH		R019	1-216-822-11	METAL CHIP 1.2K 5%	1/16W
L851	1-412-029-11	INDUCTOR CHIP 10uH		R020	1-216-830-11	METAL CHIP 5.6K 5%	1/16W
L852	1-410-993-11	INDUCTOR CHIP 1uH		R021	1-216-828-11	METAL CHIP 3.9K 5%	1/16W
L853	1-412-029-11	INDUCTOR CHIP 10uH		R022	1-216-864-11	METAL CHIP 0 5%	1/16W
< IC LINK >				R023	1-216-838-11	METAL CHIP 27K 5%	1/16W
△PS501	1-576-123-21	LINK, IC (CCP2E20 0.8A)		R024	1-216-826-11	METAL CHIP 2.7K 5%	1/16W
< TRANSISTOR >				R025	1-216-835-11	METAL CHIP 15K 5%	1/16W
Q001	8-729-420-20	TRANSISTOR XN4312		R026	1-216-817-11	METAL CHIP 470 5%	1/16W
Q002	8-729-120-28	TRANSISTOR 2SC1623-L5L6		R041	1-216-837-11	METAL CHIP 22K 5%	1/16W
Q003	8-729-905-12	TRANSISTOR DTA144EU		R042	1-216-839-11	METAL CHIP 33K 5%	1/16W
Q041	8-729-905-23	TRANSISTOR 2SA1576-R		R043	1-216-815-11	METAL CHIP 330 5%	1/16W
Q043	8-729-216-22	TRANSISTOR 2SA1162-G		R044	1-216-817-11	METAL CHIP 470 5%	1/16W
Q501	8-729-907-00	TRANSISTOR DTC114EU		R046	1-216-801-11	METAL CHIP 22 5%	1/16W
Q502	8-729-402-78	TRANSISTOR XN6401		R047	1-216-818-11	METAL CHIP 560 5%	1/16W
Q503	8-729-120-28	TRANSISTOR 2SC1623-L5L6		R048	1-216-864-11	METAL CHIP 0 5%	1/16W
Q507	8-729-905-12	TRANSISTOR DTA144EU		R501	1-216-839-11	METAL CHIP 33K 5%	1/16W
Q509	8-729-822-84	TRANSISTOR 2SB1202FAST		R502	1-216-837-11	METAL CHIP 22K 5%	1/16W
Q510	8-729-402-81	TRANSISTOR XN4501		R503	1-216-837-11	METAL CHIP 22K 5%	1/16W
Q511	8-729-402-81	TRANSISTOR XN4501		R504	1-216-845-11	METAL CHIP 100K 5%	1/16W
Q702	8-729-402-84	TRANSISTOR XN4601		R505	1-216-817-11	METAL CHIP 470 5%	1/16W
Q703	8-729-010-60	TRANSISTOR MSA1586-BC		R506	1-216-852-11	METAL CHIP 390K 5%	1/16W
Q704	8-729-010-60	TRANSISTOR MSA1586-BC		R507	1-216-849-11	METAL CHIP 220K 5%	1/16W
Q707	8-729-010-75	TRANSISTOR MSC4116-B/C		R508	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
Q708	8-729-920-XX	TRANSISTOR DTA114EU		R509	1-216-834-11	METAL CHIP 12K 5%	1/16W
Q709	8-729-905-61	TRANSISTOR DTC124EU		R510	1-216-845-11	METAL CHIP 100K 5%	1/16W
Q801	8-729-423-52	TRANSISTOR 2SC3931-C		R511	1-216-833-11	METAL CHIP 10K 5%	1/16W
Q802	8-729-403-27	TRANSISTOR XN4401		R512	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
Q851	8-729-010-75	TRANSISTOR MSC4116-B/C		R513	1-216-845-11	METAL CHIP 100K 5%	1/16W
Q853	8-729-403-27	TRANSISTOR XN4401		R514	1-216-857-11	METAL CHIP 1M 5%	1/16W
				R515	1-216-841-11	METAL CHIP 47K 5%	1/16W
				R516	1-216-841-11	METAL CHIP 47K 5%	1/16W
				R517	1-216-833-11	METAL CHIP 10K 5%	1/16W
				R518	1-216-809-11	METAL CHIP 100 5%	1/16W

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

CS-31

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W	R585	1-216-841-11	METAL CHIP	47K	5%	1/16W
R521	1-216-841-11	METAL CHIP	47K	5%	1/16W	R586	1-216-843-11	METAL CHIP	68K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W	R587	1-216-841-11	METAL CHIP	47K	5%	1/16W
R523	1-216-833-11	METAL CHIP	10K	5%	1/16W	R589	1-216-845-11	METAL CHIP	100K	5%	1/16W
R524	1-216-845-11	METAL CHIP	100K	5%	1/16W	R590	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R526	1-216-821-11	METAL CHIP	1K	5%	1/16W	R591	1-216-845-11	METAL CHIP	100K	5%	1/16W
R530	1-216-813-11	METAL CHIP	220	5%	1/16W	R592	1-216-845-11	METAL CHIP	100K	5%	1/16W
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	R594	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R600	1-216-809-11	METAL CHIP	100	5%	1/16W
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W	R601	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W	R603	1-216-845-11	METAL CHIP	100K	5%	1/16W
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	R607	1-216-295-00	METAL CHIP	0	5%	1/10W
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W	R608	1-216-295-00	METAL CHIP	0	5%	1/10W
R539	1-216-821-11	METAL CHIP	1K	5%	1/16W	R609	1-216-821-11	METAL CHIP	1K	5%	1/16W
R540	1-216-837-11	METAL CHIP	22K	5%	1/16W	R611	1-216-864-11	METAL CHIP	0	5%	1/16W
R541	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	R701	1-216-857-11	METAL CHIP	1M	5%	1/16W
R543	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	R702	1-216-821-11	METAL CHIP	1K	5%	1/16W
R544	1-216-815-11	METAL CHIP	330	5%	1/16W	R703	1-216-837-11	METAL CHIP	22K	5%	1/16W
R545	1-216-039-00	METAL CHIP	390	5%	1/10W	R704	1-216-815-11	METAL CHIP	330	5%	1/16W
R547	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R705	1-216-833-11	METAL CHIP	10K	5%	1/16W
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W	R706	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R549	1-217-671-11	METAL CHIP	1	5%	1/10W	R707	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R550	1-217-671-11	METAL CHIP	1	5%	1/10W	R708	1-216-845-11	METAL CHIP	100K	5%	1/16W
R551	1-217-671-11	METAL CHIP	1	5%	1/10W	R709	1-216-839-11	METAL CHIP	33K	5%	1/16W
R552	1-217-671-11	METAL CHIP	1	5%	1/10W	R710	1-216-857-11	METAL CHIP	1M	5%	1/16W
R553	1-216-845-11	METAL CHIP	100K	5%	1/16W	R711	1-216-864-11	METAL CHIP	0	5%	1/16W
R555	1-216-838-11	METAL CHIP	27K	5%	1/16W	R712	1-216-821-11	METAL CHIP	1K	5%	1/16W
R556	1-216-821-11	METAL CHIP	1K	5%	1/16W	R713	1-216-821-11	METAL CHIP	1K	5%	1/16W
R557	1-216-838-11	METAL CHIP	27K	5%	1/16W	R714	1-216-821-11	METAL CHIP	1K	5%	1/16W
R559	1-216-838-11	METAL CHIP	27K	5%	1/16W	R715	1-216-821-11	METAL CHIP	1K	5%	1/16W
R560	1-216-864-11	METAL CHIP	0	5%	1/16W	R716	1-216-863-11	METAL CHIP	3.3M	5%	1/16W
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W	R718	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W	R719	1-216-840-11	METAL CHIP	39K	5%	1/16W
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	R722	1-216-821-11	METAL CHIP	1K	5%	1/16W
R565	1-216-837-11	METAL CHIP	22K	5%	1/16W	R723	1-216-833-11	METAL CHIP	10K	5%	1/16W
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W	R724	1-216-821-11	METAL CHIP	1K	5%	1/16W
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W	R727	1-216-821-11	METAL CHIP	1K	5%	1/16W
R568	1-216-833-11	METAL CHIP	10K	5%	1/16W	R728	1-216-821-11	METAL CHIP	1K	5%	1/16W
R569	1-216-817-11	METAL CHIP	470	5%	1/16W	R729	1-216-821-11	METAL CHIP	1K	5%	1/16W
R570	1-216-845-11	METAL CHIP	100K	5%	1/16W	R730	1-216-864-11	METAL CHIP	0	5%	1/16W
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R732	1-216-821-11	METAL CHIP	1K	5%	1/16W
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W	R733	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R573	1-216-861-11	METAL CHIP	2.2M	5%	1/16W	R734	1-216-817-11	METAL CHIP	470	5%	1/16W
R574	1-216-821-11	METAL CHIP	1K	5%	1/16W	R735	1-216-834-11	METAL CHIP	12K	5%	1/16W
R575	1-216-851-11	METAL CHIP	330K	5%	1/16W	R736	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R577	1-216-821-11	METAL CHIP	1K	5%	1/16W	R737	1-216-813-11	METAL CHIP	220	5%	1/16W
R578	1-216-841-11	METAL CHIP	47K	5%	1/16W	R738	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R579	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R739	1-216-833-11	METAL CHIP	10K	5%	1/16W
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	R740	1-216-841-11	METAL CHIP	47K	5%	1/16W
R584	1-216-833-11	METAL CHIP	10K	5%	1/16W	R741	1-216-864-11	METAL CHIP	0	5%	1/16W

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R742	1-216-821-11	METAL CHIP	1K	5%	1/16W	R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W
R745	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R748	1-216-864-11	METAL CHIP	0	5%	1/16W	R826	1-216-837-11	METAL CHIP	22K	5%	1/16W
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W	R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W
R750	1-216-864-11	METAL CHIP	0	5%	1/16W	R836	1-216-863-11	METAL CHIP	3.3M	5%	1/16W
R752	1-216-816-11	METAL CHIP	390	5%	1/16W	R851	1-216-837-11	METAL CHIP	22K	5%	1/16W
R753	1-216-834-11	METAL CHIP	12K	5%	1/16W	R852	1-216-821-11	METAL CHIP	1K	5%	1/16W
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W	R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W	R854	1-216-833-11	METAL CHIP	10K	5%	1/16W
R756	1-216-857-11	METAL CHIP	1M	5%	1/16W	R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R757	1-216-857-11	METAL CHIP	1M	5%	1/16W	R857	1-216-848-11	METAL CHIP	180K	5%	1/16W
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W	R858	1-216-837-11	METAL CHIP	22K	5%	1/16W
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W	R859	1-216-845-11	METAL CHIP	100K	5%	1/16W
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W	R860	1-216-833-11	METAL CHIP	10K	5%	1/16W
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W	R861	1-216-833-11	METAL CHIP	10K	5%	1/16W
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W	R862	1-216-848-11	METAL CHIP	180K	5%	1/16W
R765	1-216-814-11	METAL CHIP	270	5%	1/16W	R863	1-216-855-11	METAL CHIP	680K	5%	1/16W
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W	R864	1-216-833-11	METAL CHIP	10K	5%	1/16W
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W	R865	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W	R866	1-216-820-11	METAL CHIP	820	5%	1/16W
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	R867	1-216-837-11	METAL CHIP	22K	5%	1/16W
R771	1-216-309-00	METAL CHIP	5.6	5%	1/10W	R868	1-216-833-11	METAL CHIP	10K	5%	1/16W
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W	R869	1-218-744-11	METAL CHIP	150K	0.50%	1/16W
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W	R870	1-216-841-11	METAL CHIP	47K	5%	1/16W
R777	1-216-833-11	METAL CHIP	10K	5%	1/16W	R871	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W	R872	1-216-851-11	METAL CHIP	330K	5%	1/16W
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	R873	1-216-816-11	METAL CHIP	390	5%	1/16W
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W	R874	1-216-842-11	METAL CHIP	56K	5%	1/16W
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W	R875	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R787	1-216-821-11	METAL CHIP	1K	5%	1/16W	R876	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	R877	1-218-881-11	METAL CHIP	27K	0.50%	1/16W
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	R884	1-216-837-11	METAL CHIP	22K	5%	1/16W
R794	1-216-841-11	METAL CHIP	47K	5%	1/16W	R885	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R795	1-216-841-11	METAL CHIP	47K	5%	1/16W	< COMPOSITION CIRCUIT BLOCK >					
R796	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	RB501	1-236-412-11	NETWORK, RES	1.0K		
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	RB502	1-236-424-11	NETWORK, RES	10K		
R799	1-216-821-11	METAL CHIP	1K	5%	1/16W	RB503	1-236-412-11	NETWORK, RES	1.0K		
R801	1-216-864-11	METAL CHIP	0	5%	1/16W	RB504	1-236-442-11	NETWORK, RES	330K		
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W	RB505	1-236-424-11	NETWORK, RES	10K		
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W	RB506	1-236-424-11	NETWORK, RES	10K		
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W	RB509	1-236-904-11	NETWORK, RES	1.0K		
R808	1-216-801-11	METAL CHIP	22	5%	1/16W	RB510	1-236-432-11	NETWORK, RES	47K		
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	RB512	1-236-424-11	NETWORK, RES	10K		
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W	RB513	1-236-432-11	NETWORK, RES	47K		
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	RB516	1-236-904-11	NETWORK, RES	1.0K		
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	RB517	1-236-436-11	NETWORK, RES	100K		
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	RB518	1-236-907-11	NETWORK, RES	100K		
R815	1-216-817-11	METAL CHIP	470	5%	1/16W	RB519	1-236-908-11	NETWORK, RES	10K		
R816	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	RB520	1-236-412-11	NETWORK, RES	1.0K		
R819	1-216-805-11	METAL CHIP	47	5%	1/16W						

CS-31**DK-20****MA-93****PJ-45**

Ref. No. Part No. Description

RB522 1-236-424-11 NETWORK, RES 10K
 RB523 1-236-424-11 NETWORK, RES 10K
 RB526 1-236-408-11 NETWORK, RES 470
 RB527 1-236-432-11 NETWORK, RES 47K
 RB528 1-236-432-11 NETWORK, RES 47K

RB529 1-236-424-11 NETWORK, RES 10K
 RB530 1-236-420-11 NETWORK, RES 4.7K
 RB702 1-236-432-11 NETWORK, RES 47K
 RB705 1-236-416-11 NETWORK, RES 2.2K
 RB708 1-236-416-11 NETWORK, RES 2.2K

RB709 1-236-416-11 NETWORK, RES 2.2K
 RB710 1-236-412-11 NETWORK, RES 1.0K
 RB711 1-236-412-11 NETWORK, RES 1.0K
 RB712 1-236-412-11 NETWORK, RES 1.0K
 RB713 1-236-412-11 NETWORK, RES 1.0K

RB714 1-236-412-11 NETWORK, RES 1.0K
 RB740 1-236-432-11 NETWORK, RES 47K

< VIBRATOR >

X501 1-579-368-31 VIBRATOR, CRYSTAL (11.718MHz)
 X502 1-579-550-11 VIBRATOR, CRYSTAL (32KHz)
 X503 1-578-713-21 VIBLATOR, CERAMIC (4.19MHz)
 X504 1-579-551-11 VIBRATOR, CERAMIC (700KHz)
 X701 1-579-553-11 VIBRATOR (10MHz)

X801 1-579-076-11 VIBRATOR, CRYSTAL (28.375MHz)

* A-7071-638-A DK-20 BOARD, COMPLETE

 (Ref, No 7, 000 Series)

< SWITCH >

S561 1-572-938-21 SWITCH, TACTIL (RESET)
 S562 1-572-938-21 SWITCH, TACTIL (ZEROMEM)
 S563 1-572-938-21 SWITCH, TACTIL (TAPE/BATT CHECK)

< FLAT CABLE >

W564 1-642-188-11 FP-510 FLEXIBLE BOARD

* A-7063-246-A MA-93 BOARD, COMPLETE

 (Ref, No 3, 000 Series)

1-690-603-11 CABLE, FLAT (FFC-25) 8P

< CAPACITOR >

C400 1-162-964-11 CERAMIC CHIP 0.001uF 10% 50V
 C401 1-164-677-11 CERAMIC CHIP 0.033uF 10% 16V
 C402 1-162-957-11 CERAMIC CHIP 220PF 5% 50V

Remark

Ref. No. Part No. Description

Remark

C403 1-162-964-11 CERAMIC CHIP 0.001uF 10% 50V
 C404 1-162-587-11 CERAMIC CHIP 0.039uF 10% 25V

C405 1-164-633-11 CERAMIC CHIP 0.1uF 10% 25V
 C406 1-162-953-11 CERAMIC CHIP 100PF 5% 50V
 C407 1-162-638-11 CERAMIC CHIP 1uF 16V
 C410 1-162-974-11 CERAMIC CHIP 0.01uF 50V
 C411 1-162-638-11 CERAMIC CHIP 1uF 16V

C412 1-126-205-11 ELECT CHIP 47uF 20% 6.3V
 C415 1-162-638-11 CERAMIC CHIP 1uF 16V
 C417 1-164-299-11 CERAMIC CHIP 0.22uF 10% 25V

< CONNECTOR >

CN400 1-580-057-11 PIN, CONNECTOR 4P

< DIODE >

D400 8-719-110-03 DIODE RD7.5ES-B2
 D401 8-719-110-03 DIODE RD7.5ES-B2

< IC >

IC400 8-759-822-37 IC LA7293M-TE-L
 IC401 8-749-923-29 IC RS-20E-T

< JACK >

J400 1-568-027-11 JACK, SMALL TYPE 1P (MIC)

< COIL >

L400 1-410-993-11 INDUCTOR CHIP 1uH
 L401 1-410-993-11 INDUCTOR CHIP 1uH

< TRANSISTOR >

Q400 8-729-905-23 TRANSISTOR 2SA1576-R

< RESISTOR >

R400 1-216-822-11 METAL CHIP 1.2K 5% 1/16W
 R401 1-216-830-11 METAL CHIP 5.6K 5% 1/16W
 R402 1-216-838-11 METAL CHIP 27K 5% 1/16W
 R403 1-216-838-11 METAL CHIP 27K 5% 1/16W
 R405 1-216-864-11 METAL CHIP 0 5% 1/16W

R407 1-216-831-11 METAL CHIP 6.8K 5% 1/16W
 R412 1-216-821-11 METAL CHIP 1K 5% 1/16W
 R414 1-216-864-11 METAL CHIP 0 5% 1/16W

* A-7071-634-A PJ-45 BOARD, COMPLETE (AEP/UK)

* A-7071-676-A PJ-45 BOARD, COMPLETE (AUS)

 (Ref, No 9, 000 Series)

PJ-45**PK-30****PS-282**

Ref. No.	Part No.	Description	Remark
		< BUZZER >	
BU550	1-529-107-11	BUZZER, PIEZOELECTRIC	
		< CAPACITOR >	
C550	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C551	1-164-346-11	CERAMIC CHIP 1uF 16V	
C552	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C553	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
CN550	1-691-491-21	CONNECTOR, FFC/FPC 12P	
		< DIODE >	
D550	8-719-404-46	DIODE MA110	
D551	8-719-110-03	DIODE RD7. 5ES-B2	
D552	8-719-110-03	DIODE RD7. 5ES-B2	
		< RESISTOR >	
R552	1-216-864-11	METAL CHIP 0 5% 1/16W (AEP/UK)	
		< SWITCH >	
S550	1-571-275-31	SWITCH, SLIDE (EDIT, REC MODE)	
S551	1-571-674-11	SWITCH, SLIDE (VIDEO IN/OUT) (AUS)	

*	A-7071-639-A	PK-30 BOARD, COMPLETE	

		(Ref, No 8,000 Series)	
		< CONNECTOR >	
CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P	
		< DIODE >	
D540	8-719-820-05	DIODE 1SS181	
		< SWITCH >	
S540	1-572-283-11	SWITCH, SLIDE (POWER)	
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	
S542	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER)	

*	A-7063-242-A	PS-282 BOARD, COMPLETE	

		(Ref, No 3,000 Series)	
		< CAPACITOR >	
C948	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C949	1-164-337-11	CERAMIC CHIP 2.2uF 16V	

Ref. No.	Part No.	Description	Remark
C950	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C951	1-164-384-11	CERAMIC CHIP 130PF 5% 50V	
C952	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C953	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C954	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C957	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C958	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C959	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C960	1-164-730-11	CERAMIC CHIP 0.0012uF 5% 50V	
C961	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C962	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C963	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C965	1-162-966-11	CERAMIC CHIP 0.002uF 10% 50V	
C966	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C968	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C969	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C970	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C971	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C972	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C973	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C974	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C975	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C976	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C977	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C978	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C979	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C980	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C981	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C982	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C983	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C984	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C985	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C986	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C987	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C988	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C989	1-127-559-11	ELECT (SOLID) 15uF 20% 6.3V	
C990	1-164-346-11	CERAMIC CHIP 1uF 16V	
C991	1-164-346-11	CERAMIC CHIP 1uF 16V	
C992	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C993	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C994	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C995	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C996	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C997	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C998	1-128-530-11	ELECT CHIP 33uF 20% 10V	
		< CONNECTOR >	
CN950	1-691-542-21	CONNECTOR, BOARD TO BOARD 48P	

Ref. No. Part No. Description

< DIODE >

D950 8-719-989-33 DIODE FC806
D952 8-719-110-03 DIODE RD7. 5ES-B2
D953 8-719-110-03 DIODE RD7. 5ES-B2
D961 8-719-404-46 DIODE MA110
D962 8-719-110-03 DIODE RD7. 5ES-B2

D963 8-719-110-03 DIODE RD7. 5ES-B2
D964 8-719-404-46 DIODE MA110

< IC >

△ IC950 8-759-060-94 IC MB3785APFV-G-BND-ER

< JACK >

J950 1-537-281-31 TERMINAL BOARD (EASY CONNECTOR)
J951 1-565-276-21 JACK, ULTRA SMALL 1P (REMOTE)
J952 1-568-027-11 JACK, SMALL TYPE 1P (EARPHONE)

< COIL >

L950 1-424-519-21 COIL, MOLD CHOKE 1.0uH
L951 1-424-519-21 COIL, MOLD CHOKE 1.0uH
L952 1-424-519-21 COIL, MOLD CHOKE 1.0uH
L953 1-424-519-21 COIL, MOLD CHOKE 1.0uH
L954 1-424-522-21 COIL, CHOKE 10uH

L955 1-424-522-21 COIL, CHOKE 10uH
L956 1-424-522-21 COIL, CHOKE 10uH
L957 1-424-524-21 COIL, CHOKE 47uH
L958 1-412-034-11 INDUCTOR CHIP 330uH
L959 1-412-034-11 INDUCTOR CHIP 330uH

L960 1-412-027-11 INDUCTOR CHIP 2.2uH
L961 1-412-029-11 INDUCTOR CHIP 10uH
L962 1-412-029-11 INDUCTOR CHIP 10uH
L963 1-412-028-11 INDUCTOR CHIP 4.7uH
L964 1-424-524-21 COIL, CHOKE 47uH

L965 1-424-524-21 COIL, CHOKE 47uH
L966 1-410-369-11 INDUCTOR CHIP 1uH
L967 1-410-369-11 INDUCTOR CHIP 1uH
L968 1-412-979-21 INDUCTOR 1uH
L972 1-412-979-21 INDUCTOR 1uH

L973 1-412-026-11 INDUCTOR CHIP 1uH
L974 1-412-979-21 INDUCTOR 1uH
L976 1-412-026-11 INDUCTOR CHIP 1uH

< IC LINK >

△ PS950 1-532-841-21 LINK, IC (SOC1600 1.6A)
△ PS951 1-532-841-21 LINK, IC (SOC1600 1.6A)

< TRANSISTOR >

Q950 8-729-823-95 TRANSISTOR FC149
Q951 8-729-804-41 TRANSISTOR 2SB1122-ST

Remark

Ref. No. Part No. Description

Remark

Q952 8-729-823-84 TRANSISTOR FP102
Q953 8-729-823-82 TRANSISTOR FP101
Q954 8-729-823-82 TRANSISTOR FP101

Q955 8-729-905-12 TRANSISTOR DTA144EU
Q957 8-729-011-26 TRANSISTOR 2SJ179
Q958 8-729-920-48 TRANSISTOR 1MH2
Q959 8-729-011-26 TRANSISTOR 2SJ179
Q960 8-729-402-81 TRANSISTOR XN4501

< RESISTOR >

R950 1-216-837-11 METAL CHIP 22K 5% 1/16W
R951 1-218-720-11 METAL CHIP 15K 0.50% 1/16W
R952 1-216-842-11 METAL CHIP 56K 5% 1/16W
R953 1-216-837-11 METAL CHIP 22K 5% 1/16W
R954 1-216-831-11 METAL CHIP 6.8K 5% 1/16W

R955 1-216-827-11 METAL CHIP 3.3K 5% 1/16W
R956 1-218-347-11 METAL CHIP 91K 5% 1/16W
R957 1-218-332-11 METAL CHIP 130K 5% 1/16W
R958 1-216-823-11 METAL CHIP 1.5K 5% 1/16W
R959 1-218-720-11 METAL CHIP 15K 0.50% 1/16W

R960 1-218-296-11 METAL CHIP 75K 0.50% 1/16W
R961 1-216-834-11 METAL CHIP 12K 5% 1/16W
R962 1-216-829-11 METAL CHIP 4.7K 5% 1/16W
R964 1-218-720-11 METAL CHIP 15K 0.50% 1/16W
R965 1-216-833-11 METAL CHIP 10K 5% 1/16W

R966 1-218-706-11 METAL CHIP 3.9K 0.50% 1/16W
R967 1-216-841-11 METAL CHIP 47K 5% 1/16W
R968 1-216-832-11 METAL CHIP 8.2K 5% 1/16W
R969 1-216-823-11 METAL CHIP 1.5K 5% 1/16W
R970 1-216-830-11 METAL CHIP 5.6K 5% 1/16W

R971 1-218-330-11 METAL CHIP 11K 0.50% 1/16W
R972 1-216-845-11 METAL CHIP 100K 5% 1/16W
R973 1-216-829-11 METAL CHIP 4.7K 5% 1/16W
R974 1-216-829-11 METAL CHIP 4.7K 5% 1/16W
R975 1-216-176-00 METAL CHIP 120 5% 1/8W

R976 1-216-182-00 METAL CHIP 220 5% 1/8W
R977 1-216-182-00 METAL CHIP 220 5% 1/8W
R978 1-216-182-00 METAL CHIP 220 5% 1/8W
R980 1-216-827-11 METAL CHIP 3.3K 5% 1/16W
R981 1-216-841-11 METAL CHIP 47K 5% 1/16W

R982 1-216-845-11 METAL CHIP 100K 5% 1/16W
R983 1-216-821-11 METAL CHIP 1K 5% 1/16W
R984 1-216-836-11 METAL CHIP 18K 5% 1/16W
R985 1-218-883-11 METAL CHIP 33K 0.50% 1/16W
R986 1-216-845-11 METAL CHIP 100K 5% 1/16W

R987 1-216-833-11 METAL CHIP 10K 5% 1/16W
R988 1-216-825-11 METAL CHIP 2.2K 5% 1/16W
R989 1-216-820-11 METAL CHIP 820 5% 1/16W

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

PS-282

SL-22

SW-200

VA-71

Ref. No.	Part No.	Description	Remark
< TRANSFORMER >			
T950	1-450-768-21	TRANSFORMER, CONVERTER	
< VIBRATOR >			
X950	1-579-467-11	VIBRATOR, CERAMIC (475KHz)	

*	A-7063-245-A	SL-22 BOARD, COMPLETE ***** (Ref, No 3, 000 Series)	
< CAPACITOR >			
C500	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C503	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C504	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C505	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C506	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C507	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
< CONNECTOR >			
CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P	
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P	
< IC >			
IC501	8-759-059-09	IC LB8111V	
< COIL >			
L501	1-412-026-11	INDUCTOR CHIP 1uH	
< TRANSISTOR >			
Q501	8-729-402-81	TRANSISTOR XN4501	
< RESISTOR >			
R501	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R504	1-216-864-11	METAL CHIP 0 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R512	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R517	1-216-174-00	METAL CHIP 100 5% 1/8W	
R519	1-216-864-11	METAL CHIP 0 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0 5% 1/16W	
< COMPOSITION CIRCUIT BLOCK >			
RB500	1-236-424-11	NETWORK, RES 10K	
RB502	1-236-424-11	NETWORK, RES 10K	

Ref. No.	Part No.	Description	Remark
< FLAT CABLE >			
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

*	A-7071-633-A	SW-200 BOARD, COMPLETE ***** (Ref, No 5, 000 Series)	
< CONNECTOR >			
CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P	
< SWITCH >			
S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)	
S581	1-571-275-31	SWITCH, SLIDE (STAND BY)	

*	A-7063-244-A	VA-71 BOARD, COMPLETE (AEP/UK) *****	
*	A-7063-295-A	VA-71 BOARD, COMPLETE (AUS) ***** (Ref, No 2, 000 Series)	
*	3-946-181-01	CASE (MAIN), SHIELD, VA	
*	3-946-182-01	CASE (LID), SHIELD, VA	
< CAPACITOR >			
C052	1-162-638-11	CERAMIC CHIP 1uF 16V	
C053	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C054	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C055	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C056	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C057	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C058	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C059	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C060	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C061	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C062	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C063	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C064	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C065	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C066	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C070	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C071	1-128-003-11	ELECT CHIP 22uF 20% 4V	
C072	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C073	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C074	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C075	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C077	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C078	1-162-943-11	CERAMIC CHIP 15PF 5% 50V	
C090	1-162-974-11	CERAMIC CHIP 0.01uF 50V	

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C091	1-128-004-11	ELECT CHIP	10uF	20%	16V	C223	1-128-004-11	ELECT CHIP	10uF	20%	16V
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C224	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C093	1-164-506-11	CERAMIC CHIP	4.7uF		16V	C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C095	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C226	1-128-004-11	ELECT CHIP	10uF	20%	16V
C096	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C227	1-128-004-11	ELECT CHIP	10uF	20%	16V
C101	1-128-004-11	ELECT CHIP	10uF	20%	16V	C228	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C229	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C230	1-126-246-11	ELECT CHIP	220uF	20%	4V
C104	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	C231	1-128-004-11	ELECT CHIP	10uF	20%	16V
C105	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C232	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C106	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C107	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	C235	1-128-004-11	ELECT CHIP	10uF	20%	16V
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	C237	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C109	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	C238	1-126-607-11	ELECT CHIP	47uF	20%	4V
C110	1-162-934-11	CERAMIC CHIP	3PF	0.5PF	50V	C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	C240	1-128-004-11	ELECT CHIP	10uF	20%	16V
C113	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C114	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	C242	1-128-004-11	ELECT CHIP	10uF	20%	16V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C244	1-128-004-11	ELECT CHIP	10uF	20%	16V
C117	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C119	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C121	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C123	1-162-922-11	CERAMIC CHIP	39PF	5%	50V	C251	1-128-004-11	ELECT CHIP	10uF	20%	16V
C124	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V	C252	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C125	1-162-926-11	CERAMIC CHIP	82PF	5%	50V	C253	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C126	1-162-923-11	CERAMIC CHIP	47PF	5%	50V	C254	1-164-363-11	CERAMIC CHIP	560PF	5%	50V
C127	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	C255	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V	C256	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	C257	1-126-207-11	ELECT CHIP	33uF	20%	4V
C202	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	C258	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V	C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V	C260	1-128-004-11	ELECT CHIP	10uF	20%	16V
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V	C261	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C271	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C272	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V	C273	1-126-607-11	ELECT CHIP	47uF	20%	4V
C209	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	C274	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V	C276	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C212	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	C277	1-128-004-11	ELECT CHIP	10uF	20%	16V
C213	1-128-004-11	ELECT CHIP	10uF	20%	16V	C279	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C214	1-128-004-11	ELECT CHIP	10uF	20%	16V	C280	1-128-004-11	ELECT CHIP	10uF	20%	16V
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V	C282	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C217	1-164-005-11	CERAMIC CHIP	0.47uF		25V	C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C218	1-128-004-11	ELECT CHIP	10uF	20%	16V	C295	1-128-004-11	ELECT CHIP	10uF	20%	16V
C219	1-164-005-11	CERAMIC CHIP	0.47uF		25V	C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C221	1-128-004-11	ELECT CHIP	10uF	20%	16V	C303	1-128-004-11	ELECT CHIP	10uF	20%	16V
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C308	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V	C406	1-164-346-11	CERAMIC CHIP	1uF		16V
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V	C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C311	1-126-192-11	ELECT CHIP	0.68uF	20%	50V	C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	C416	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V	C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C314	1-128-004-11	ELECT CHIP	10uF	20%	16V	C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	C427	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C316	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	C428	1-126-607-11	ELECT CHIP	47uF	20%	4V
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C429	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V	C430	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V
C320	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	C432	1-164-346-11	CERAMIC CHIP	1uF		16V
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C434	1-164-346-11	CERAMIC CHIP	1uF		16V
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C435	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C323	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	C439	1-164-346-11	CERAMIC CHIP	1uF		16V
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	C440	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	C442	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	C443	1-128-004-11	ELECT CHIP	10uF	20%	16V
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C444	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	C446	1-128-013-11	ELECT CHIP	1uF	20%	50V
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V	C448	1-128-004-11	ELECT CHIP	10uF	20%	16V
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	C450	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	C453	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	C454	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C456	1-164-346-11	CERAMIC CHIP	1uF		16V
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	C459	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V	C461	1-126-607-11	ELECT CHIP	47uF	20%	4V
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V	C490	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C361	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V	C494	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C362	1-164-156-11	CERAMIC CHIP	0.1uF		25V	C498	1-128-003-11	ELECT CHIP	22uF	20%	4V
C363	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	C990	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C364	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C991	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C365	1-162-974-11	CERAMIC CHIP	0.01uF		50V						
C366	1-162-638-11	CERAMIC CHIP	1uF		16V						
C367	1-162-974-11	CERAMIC CHIP	0.01uF		50V						
C368	1-164-383-11	CERAMIC CHIP	110PF	5%	50V						
C369	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V						
C370	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V						
C371	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V						
C372	1-164-145-11	CERAMIC CHIP	390PF	5%	50V						
C373	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V						
C374	1-162-974-11	CERAMIC CHIP	0.01uF		50V						
C376	1-162-638-11	CERAMIC CHIP	1uF		16V						
C377	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V						
C378	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V						
C379	1-162-974-11	CERAMIC CHIP	0.01uF		50V						
C400	1-124-778-00	ELECT CHIP	22uF	20%	6.3V						
< FILTER >											
CF301	1-579-371-11	FILTER, CERAMIC									
< CONNECTOR >											
CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P									
CN202	1-691-476-21	CONNECTOR, BOARD TO BOARD 20P									
CN400	1-691-487-21	CONNECTOR, FFC/FPC 8P									
< DIODE >											
D102	8-719-800-76	DIODE	1SS226								
D201	8-719-941-86	DIODE	DAN202U								
D202	8-719-941-86	DIODE	DAN202U								
D203	8-719-941-09	DIODE	DAP202U								
D205	8-719-941-86	DIODE	DAN202U								

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Ref. No.	Part No.	Description
D206	8-719-941-86	DIODE DAN202U
D301	8-719-940-45	DIODE DWA010
D361	8-719-941-86	DIODE DAN202U
D362	8-719-941-86	DIODE DAN202U
D401	8-719-105-32	DIODE RD2. 7M-B2

< FILTER >

FL051	1-236-848-21	FILTER, LOW PASS
FL052	1-239-055-21	FILTER, LOW PASS (CCD. PAL. Y)
FL053	1-236-834-21	FILTER, LOW PASS
FL054	1-415-751-21	DELAY LINE, LC (YH)
FL201	1-239-113-21	FILTER, LOW PASS (REC. Y)
FL301	1-236-849-21	FILTER, BAND PASS
FL302	1-236-186-11	FILTER, BAND PASS
FL361	1-236-850-21	FILTER, BAND PASS

< IC >

IC051	8-752-333-24	IC CXL1506M
IC052	8-759-710-29	IC NJM2235M
IC053	8-759-031-84	IC SCT504F
IC054	8-752-053-21	IC CXA1211M
IC201	8-752-036-19	IC CXA1207AR

IC202	8-759-710-29	IC NJM2235M
IC203	8-759-055-82	IC M62353GP
IC204	8-759-055-82	IC M62353GP
IC205	8-759-636-33	IC CXA1452
IC206	8-752-053-21	IC CXA1211M

IC301	8-752-036-20	IC CXA1208R
IC361	8-759-605-61	IC CXA1203N
IC400	8-759-234-77	IC TC4S66F
IC401	8-759-824-22	IC CXA1535R

< COIL >

L051	1-412-026-11	INDUCTOR CHIP 1uH
L052	1-412-031-11	INDUCTOR CHIP 47uH
L053	1-412-029-11	INDUCTOR CHIP 10uH
L054	1-410-656-11	INDUCTOR CHIP 150uH
L090	1-412-029-11	INDUCTOR CHIP 10uH

L101	1-412-029-11	INDUCTOR CHIP 10uH
L102	1-410-385-11	INDUCTOR CHIP 22uH
L103	1-412-280-31	INDUCTOR 330uH
L104	1-410-167-41	INDUCTOR CHIP 820uH
L105	1-410-657-21	INDUCTOR CHIP 180uH

L109	1-410-657-21	INDUCTOR CHIP 180uH
L110	1-410-387-11	INDUCTOR CHIP 33uH
L113	1-410-381-11	INDUCTOR CHIP 10uH
L114	1-410-380-31	INDUCTOR CHIP 8. 2uH
L115	1-412-280-31	INDUCTOR 330uH

L116	1-410-655-31	INDUCTOR CHIP 120uH
L117	1-410-658-31	INDUCTOR CHIP 220uH
L202	1-412-031-11	INDUCTOR CHIP 47uH

Remark	Ref. No.	Part No.	Description	Remark
	L203	1-412-029-11	INDUCTOR CHIP 10uH	
	L204	1-410-393-11	INDUCTOR CHIP 100uH	
	L205	1-410-375-11	INDUCTOR CHIP 3. 3uH	
	L206	1-410-379-21	INDUCTOR CHIP 6. 8uH	
	L207	1-410-390-11	INDUCTOR CHIP 56uH	
	L208	1-410-389-31	INDUCTOR CHIP 47uH	
	L209	1-410-658-31	INDUCTOR CHIP 220uH	
	L210	1-410-370-31	INDUCTOR CHIP 1. 2uH	
	L211	1-410-390-11	INDUCTOR CHIP 56uH	
	L212	1-410-370-31	INDUCTOR CHIP 1. 2uH	
	L213	1-410-386-11	INDUCTOR CHIP 27uH	
	L302	1-410-386-11	INDUCTOR CHIP 27uH	
	L303	1-410-393-11	INDUCTOR CHIP 100uH	
	L304	1-410-379-21	INDUCTOR CHIP 6. 8uH	
	L305	1-410-393-11	INDUCTOR CHIP 100uH	
	L306	1-410-655-31	INDUCTOR CHIP 120uH	
	L307	1-410-656-11	INDUCTOR CHIP 150uH	
	L308	1-410-393-11	INDUCTOR CHIP 100uH	
	L990	1-412-026-11	INDUCTOR CHIP 1uH	
	< TRANSISTOR >			
	Q051	8-729-920-48	TRANSISTOR 1MH2	
	Q052	8-729-141-48	TRANSISTOR 2SB624-BV345	
	Q053	8-729-905-23	TRANSISTOR 2SA1576-R	
	Q054	8-729-905-23	TRANSISTOR 2SA1576-R	
	Q055	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q056	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q057	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q060	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q061	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q063	8-729-422-54	TRANSISTOR XN4215	
	Q064	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q065	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q066	8-729-905-23	TRANSISTOR 2SA1576-R	
	Q067	8-729-905-96	TRANSISTOR DTA114TU	
	Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q104	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q110	8-729-920-XX	TRANSISTOR DTA114EU	
	Q111	8-729-102-07	TRANSISTOR 2SC2223-F13	
	Q114	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q118	8-729-920-48	TRANSISTOR 1MH2	
	Q119	8-729-905-23	TRANSISTOR 2SA1576-R	
	Q120	8-729-102-07	TRANSISTOR 2SC2223-F13	
	Q121	8-729-905-23	TRANSISTOR 2SA1576-R	
	Q122	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q202	8-729-905-23	TRANSISTOR 2SA1576-R	
	Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
	Q207	8-729-905-12	TRANSISTOR DTA144EU	
	Q212	8-729-920-48	TRANSISTOR 1MH2	
	Q213	8-729-905-18	TRANSISTOR DTC144EU	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YQ	< RESISTOR >			
Q215	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R051	1-216-833-11	METAL CHIP	10K 5% 1/16W
Q216	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R052	1-216-841-11	METAL CHIP	47K 5% 1/16W
Q217	8-729-905-12	TRANSISTOR	DTA144EU	R053	1-216-827-11	METAL CHIP	3.3K 5% 1/16W
Q218	8-729-402-81	TRANSISTOR	XN4501	R054	1-216-857-11	METAL CHIP	1M 5% 1/16W
Q220	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R055	1-216-810-11	METAL CHIP	120 5% 1/16W
Q222	8-729-402-81	TRANSISTOR	XN4501	R056	1-216-844-11	METAL CHIP	82K 5% 1/16W
Q223	8-729-905-12	TRANSISTOR	DTA144EU	R058	1-216-864-11	METAL CHIP	0 5% 1/16W
Q224	8-729-905-18	TRANSISTOR	DTC144EU	R062	1-216-839-11	METAL CHIP	33K 5% 1/16W
Q225	8-729-905-18	TRANSISTOR	DTC144EU	R063	1-216-842-11	METAL CHIP	56K 5% 1/16W
Q226	8-729-823-16	TRANSISTOR	2SC4555-5.6.7	R064	1-216-817-11	METAL CHIP	470 5% 1/16W
Q227	8-729-905-18	TRANSISTOR	DTC144EU	R065	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q228	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R066	1-216-839-11	METAL CHIP	33K 5% 1/16W
Q229	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R067	1-216-842-11	METAL CHIP	56K 5% 1/16W
Q230	8-729-905-23	TRANSISTOR	2SA1576-R	R068	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q231	8-729-925-42	TRANSISTOR	IMT2	R069	1-216-817-11	METAL CHIP	470 5% 1/16W
Q232	8-729-905-23	TRANSISTOR	2SA1576-R	R070	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q233	8-729-925-42	TRANSISTOR	IMT2	R071	1-216-826-11	METAL CHIP	2.7K 5% 1/16W
Q234	8-729-905-18	TRANSISTOR	DTC144EU	R072	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q235	8-729-905-23	TRANSISTOR	2SA1576-R	R073	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q302	8-729-402-81	TRANSISTOR	XN4501	R074	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q304	8-729-905-12	TRANSISTOR	DTA144EU	R075	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q306	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R076	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q307	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R077	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q308	8-729-905-23	TRANSISTOR	2SA1576-R	R078	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q309	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R079	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q310	8-729-905-18	TRANSISTOR	DTC144EU	R081	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q311	8-729-905-23	TRANSISTOR	2SA1576-R	R082	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
Q312	8-729-420-20	TRANSISTOR	XN4312	R083	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q313	8-729-905-12	TRANSISTOR	DTA144EU	R085	1-216-827-11	METAL CHIP	3.3K 5% 1/16W
Q314	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R086	1-216-827-11	METAL CHIP	3.3K 5% 1/16W
Q315	8-729-905-12	TRANSISTOR	DTA144EU	R088	1-216-847-11	METAL CHIP	150K 5% 1/16W
Q316	8-729-920-48	TRANSISTOR	IMH2	R089	1-216-839-11	METAL CHIP	33K 5% 1/16W
Q317	8-729-420-20	TRANSISTOR	XN4312	R090	1-216-838-11	METAL CHIP	27K 5% 1/16W
Q318	8-729-905-18	TRANSISTOR	DTC144EU	R091	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
Q319	8-729-905-18	TRANSISTOR	DTC144EU	R092	1-216-837-11	METAL CHIP	22K 5% 1/16W
Q361	8-729-102-07	TRANSISTOR	2SC2223-F13	R093	1-216-839-11	METAL CHIP	33K 5% 1/16W
Q362	8-729-905-18	TRANSISTOR	DTC144EU	R105	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q363	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R106	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q364	8-729-905-12	TRANSISTOR	DTA144EU	R107	1-216-811-11	METAL CHIP	150 5% 1/16W
Q365	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R108	1-216-831-11	METAL CHIP	6.8K 5% 1/16W
Q366	8-729-905-18	TRANSISTOR	DTC144EU	R109	1-216-835-11	METAL CHIP	15K 5% 1/16W
Q367	8-729-905-18	TRANSISTOR	DTC144EU	R110	1-216-821-11	METAL CHIP	1K 5% 1/16W
Q368	8-729-905-12	TRANSISTOR	DTA144EU	R111	1-216-813-11	METAL CHIP	220 5% 1/16W
Q401	8-729-921-08	TRANSISTOR	DTC144TU	R114	1-216-819-11	METAL CHIP	680 5% 1/16W
Q402	8-729-905-18	TRANSISTOR	DTC144EU	R125	1-216-826-11	METAL CHIP	2.7K 5% 1/16W
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ	R126	1-216-835-11	METAL CHIP	15K 5% 1/16W
Q991	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R127	1-216-834-11	METAL CHIP	12K 5% 1/16W
				R128	1-216-833-11	METAL CHIP	10K 5% 1/16W
				R129	1-216-817-11	METAL CHIP	470 5% 1/16W

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Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R130	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	R233	1-218-748-11	METAL CHIP	220K	0.50%	1/16W
R131	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	R234	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R132	1-216-808-11	METAL CHIP	82	5%	1/16W	R235	1-218-688-11	METAL CHIP	680	0.50%	1/16W
R133	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	R237	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W
R140	1-216-836-11	METAL CHIP	18K	5%	1/16W	R239	1-216-817-11	METAL CHIP	470	5%	1/16W
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W	R244	1-216-833-11	METAL CHIP	10K	5%	1/16W
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W	R246	1-216-833-11	METAL CHIP	10K	5%	1/16W
R143	1-216-804-11	METAL CHIP	39	5%	1/16W	R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R144	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	R248	1-216-833-11	METAL CHIP	10K	5%	1/16W
R145	1-216-821-11	METAL CHIP	1K	5%	1/16W	R249	1-216-813-11	METAL CHIP	220	5%	1/16W
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	R250	1-216-841-11	METAL CHIP	47K	5%	1/16W
R148	1-216-818-11	METAL CHIP	560	5%	1/16W	R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R150	1-216-817-11	METAL CHIP	470	5%	1/16W	R252	1-216-833-11	METAL CHIP	10K	5%	1/16W
R151	1-216-817-11	METAL CHIP	470	5%	1/16W	R253	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	R254	1-216-833-11	METAL CHIP	10K	5%	1/16W
R153	1-216-818-11	METAL CHIP	560	5%	1/16W	R256	1-216-810-11	METAL CHIP	120	5%	1/16W
R154	1-216-818-11	METAL CHIP	560	5%	1/16W	R257	1-216-813-11	METAL CHIP	220	5%	1/16W
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	R258	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R156	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R260	1-216-815-11	METAL CHIP	330	5%	1/16W
R157	1-216-864-11	METAL CHIP	0	5%	1/16W	R261	1-216-864-11	METAL CHIP	0	5%	1/16W
R158	1-216-817-11	METAL CHIP	470	5%	1/16W	R262	1-216-815-11	METAL CHIP	330	5%	1/16W
R159	1-216-815-11	METAL CHIP	330	5%	1/16W	R263	1-216-820-11	METAL CHIP	820	5%	1/16W
R201	1-216-820-11	METAL CHIP	820	5%	1/16W	R264	1-216-864-11	METAL CHIP	0	5%	1/16W
R202	1-216-820-11	METAL CHIP	820	5%	1/16W	R265	1-216-839-11	METAL CHIP	33K	5%	1/16W
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	R266	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	R267	1-216-817-11	METAL CHIP	470	5%	1/16W
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	R268	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R208	1-216-804-11	METAL CHIP	39	5%	1/16W	R269	1-216-837-11	METAL CHIP	22K	5%	1/16W
R209	1-216-804-11	METAL CHIP	39	5%	1/16W	R270	1-216-840-11	METAL CHIP	39K	5%	1/16W
R211	1-216-820-11	METAL CHIP	820	5%	1/16W	R271	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R213	1-216-804-11	METAL CHIP	39	5%	1/16W	R275	1-216-837-11	METAL CHIP	22K	5%	1/16W
R214	1-216-804-11	METAL CHIP	39	5%	1/16W	R276	1-216-817-11	METAL CHIP	470	5%	1/16W
R215	1-216-807-11	METAL CHIP	68	5%	1/16W	R277	1-216-817-11	METAL CHIP	470	5%	1/16W
R216	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	R278	1-216-818-11	METAL CHIP	560	5%	1/16W
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W	R279	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R220	1-216-818-11	METAL CHIP	560	5%	1/16W	R280	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R221	1-216-818-11	METAL CHIP	560	5%	1/16W	R281	1-216-817-11	METAL CHIP	470	5%	1/16W
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	R282	1-216-817-11	METAL CHIP	470	5%	1/16W
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	R283	1-216-817-11	METAL CHIP	470	5%	1/16W
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	R284	1-216-815-11	METAL CHIP	330	5%	1/16W
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R285	1-216-821-11	METAL CHIP	1K	5%	1/16W
R226	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	R286	1-216-812-11	METAL CHIP	180	5%	1/16W
R227	1-218-672-11	METAL CHIP	150	0.50%	1/16W	R287	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R228	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W	R290	1-216-817-11	METAL CHIP	470	5%	1/16W
R229	1-216-848-11	METAL CHIP	180K	5%	1/16W	R291	1-216-817-11	METAL CHIP	470	5%	1/16W
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	R292	1-216-817-11	METAL CHIP	470	5%	1/16W
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	R294	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R232	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	R295	1-216-821-11	METAL CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R296	1-216-833-11	METAL CHIP	10K	5%	1/16W	R361	1-216-833-11	METAL CHIP	10K	5%	1/16W
R298	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	R362	1-216-839-11	METAL CHIP	33K	5%	1/16W
R299	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R363	1-216-833-11	METAL CHIP	10K	5%	1/16W
R301	1-218-740-11	METAL CHIP	100K	0. 50%	1/16W	R365	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W
R305	1-216-828-11	METAL CHIP	3. 9K	5%	1/16W	R366	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R306	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W	R367	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W
R307	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	R368	1-216-864-11	METAL CHIP	0	5%	1/16W
R308	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W	R369	1-216-845-11	METAL CHIP	100K	5%	1/16W
R309	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W	R370	1-216-833-11	METAL CHIP	10K	5%	1/16W
R310	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	R372	1-216-833-11	METAL CHIP	10K	5%	1/16W
R311	1-216-817-11	METAL CHIP	470	5%	1/16W	R374	1-216-845-11	METAL CHIP	100K	5%	1/16W
R312	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W	R375	1-216-845-11	METAL CHIP	100K	5%	1/16W
R313	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R378	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W
R314	1-216-838-11	METAL CHIP	27K	5%	1/16W	R379	1-216-845-11	METAL CHIP	100K	5%	1/16W
R315	1-216-834-11	METAL CHIP	12K	5%	1/16W	R380	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W	R381	1-216-845-11	METAL CHIP	100K	5%	1/16W
R319	1-216-831-11	METAL CHIP	6. 8K	5%	1/16W	R383	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R320	1-216-817-11	METAL CHIP	470	5%	1/16W	R385	1-216-296-00	METAL CHIP	0	5%	1/8W
R321	1-216-824-11	METAL CHIP	1. 8K	5%	1/16W	R391	1-216-864-11	METAL CHIP	0	5%	1/16W
R322	1-216-824-11	METAL CHIP	1. 8K	5%	1/16W	R393	1-216-833-11	METAL CHIP	10K	5%	1/16W
R323	1-216-822-11	METAL CHIP	1. 2K	5%	1/16W	R400	1-216-833-11	METAL CHIP	10K	5%	1/16W
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	R402	1-216-851-11	METAL CHIP	330K	5%	1/16W
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	R403	1-216-837-11	METAL CHIP	22K	5%	1/16W
R327	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W	R404	1-216-849-11	METAL CHIP	220K	5%	1/16W
R328	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W	R406	1-216-859-11	METAL CHIP	1. 5M	5%	1/16W
R329	1-216-822-11	METAL CHIP	1. 2K	5%	1/16W	R410	1-216-841-11	METAL CHIP	47K	5%	1/16W
R330	1-216-822-11	METAL CHIP	1. 2K	5%	1/16W	R412	1-216-835-11	METAL CHIP	15K	5%	1/16W
R331	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R413	1-216-864-11	METAL CHIP	0	5%	1/16W
R332	1-216-818-11	METAL CHIP	560	5%	1/16W	R414	1-216-839-11	METAL CHIP	33K	5%	1/16W
R333	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	R416	1-216-831-11	METAL CHIP	6. 8K	5%	1/16W
R334	1-216-864-11	METAL CHIP	0	5%	1/16W	R417	1-216-839-11	METAL CHIP	33K	5%	1/16W
R337	1-216-821-11	METAL CHIP	1K	5%	1/16W	R419	1-216-840-11	METAL CHIP	39K	5%	1/16W
R338	1-216-833-11	METAL CHIP	10K	5%	1/16W	R421	1-216-839-11	METAL CHIP	33K	5%	1/16W
R339	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R423	1-216-833-11	METAL CHIP	10K	5%	1/16W
R340	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R429	1-216-821-11	METAL CHIP	1K	5%	1/16W
R341	1-216-833-11	METAL CHIP	10K	5%	1/16W	R470	1-216-808-11	METAL CHIP	82	5%	1/16W
R342	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R471	1-216-821-11	METAL CHIP	1K	5%	1/16W
R343	1-216-813-11	METAL CHIP	220	5%	1/16W	R472	1-216-841-11	METAL CHIP	47K	5%	1/16W
R345	1-216-864-11	METAL CHIP	0	5%	1/16W	R473	1-216-849-11	METAL CHIP	220K	5%	1/16W
R347	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	R476	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W
R348	1-216-840-11	METAL CHIP	39K	5%	1/16W	R478	1-216-864-11	METAL CHIP	0	5%	1/16W
R351	1-216-821-11	METAL CHIP	1K	5%	1/16W	R480	1-216-851-11	METAL CHIP	330K	5%	1/16W
R352	1-216-821-11	METAL CHIP	1K	5%	1/16W	R481	1-216-849-11	METAL CHIP	220K	5%	1/16W
R353	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R950	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R354	1-216-833-11	METAL CHIP	10K	5%	1/16W	R953	1-216-813-11	METAL CHIP	220	5%	1/16W
R355	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	R954	1-216-837-11	METAL CHIP	22K	5%	1/16W
R357	1-216-839-11	METAL CHIP	33K	5%	1/16W	R955	1-216-833-11	METAL CHIP	10K	5%	1/16W
R358	1-216-833-11	METAL CHIP	10K	5%	1/16W	R956	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R359	1-216-821-11	METAL CHIP	1K	5%	1/16W	R957	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W
R360	1-216-817-11	METAL CHIP	470	5%	1/16W	R958	1-216-815-11	METAL CHIP	330	5%	1/16W

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R960	1-216-817-11	METAL CHIP 470 5% 1/16W				(CONNECTOR)	
R961	1-216-821-11	METAL CHIP 1K 5% 1/16W		* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P	
R962	1-216-815-11	METAL CHIP 330 5% 1/16W		* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
R963	1-216-840-11	METAL CHIP 39K 5% 1/16W		* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
R964	1-216-836-11	METAL CHIP 18K 5% 1/16W				(DIODE)	
R965	1-216-821-11	METAL CHIP 1K 5% 1/16W					
R990	1-216-830-11	METAL CHIP 5.6K 5% 1/16W		D501	8-719-024-87	DIODE LN1261CAL	
R991	1-216-138-00	METAL CHIP 3.3 5% 1/8W		D502	8-719-024-87	DIODE LN1261CAL	
R995	1-216-820-11	METAL CHIP 820 5% 1/16W		D503	8-719-400-20	DIODE MA152WA	
R996	1-216-836-11	METAL CHIP 18K 5% 1/16W				(IC)	
		(COMPOSITION CIRCUIT BLOCK)		IC501	8-759-420-01	IC AN2512S	
RB101	1-236-428-11	NETWORK, RES 22K				(COIL)	
RB201	1-236-424-11	NETWORK, RES 10K					
RB301	1-236-414-11	NETWORK, RES 1.5K		L501	1-412-031-11	INDUCTOR CHIP 47uH	
		(VARIABLE RESISTOR)		L502	1-410-385-11	INDUCTOR CHIP 22uH	
RV051	1-238-087-11	RES, ADJ, CERMET 1K		△L503	1-460-220-11	COIL, FERRITE (HLC)	
		(THERMISTOR)				(TRANSISTOR)	
TH101	1-809-355-11	THERMISTOR, NTC (2125)		Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
		(VIBRATOR)		Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	
X301	1-577-117-21	OSCILLATOR, CRYSTAL (4.433619MHz)				(RESISTOR)	
*****				R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
*	A-7063-129-A	VF-44 BOARD, COMPLETE		R502	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
		*****		R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
		(Ref, No 2, 000 Series)		R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
		(CAPACITOR)		R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
C501	1-163-115-00	CERAMIC CHIP 82PF 5% 50V		R508	1-216-005-00	METAL CHIP 15 5% 1/10W	
C502	1-126-176-11	ELECT 220uF 20% 10V		R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
C503	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V		R510	1-216-079-00	METAL CHIP 18K 5% 1/10W	
C504	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V		R511	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
△C505	1-163-053-00	CERAMIC CHIP 0.0033uF 10% 50V		R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
△C506	1-163-058-00	CERAMIC CHIP 0.0082uF 10% 50V		R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
C508	1-127-515-11	ELECT (SOLID) 47uF 20% 6.3V		R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
C509	1-126-090-11	ELECT 82uF 20% 10V		R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V		R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
C511	1-124-257-00	ELECT 2.2uF 20% 50V		R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V		R518	1-216-336-11	METAL CHIP 47K 1% 1/10W	
C513	1-137-306-11	FILM CHIP 0.1uF 5% 16V		R519	1-216-107-00	METAL CHIP 270K 5% 1/10W	
C514	1-162-638-11	CERAMIC CHIP 1uF 16V		R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
C515	1-131-381-00	TANTALUM 47uF 10% 10V		R521	1-216-160-00	METAL CHIP 27 5% 1/8W	
C516	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V		R522	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
C517	1-135-091-00	TANTALUM CHIP 1uF 20% 16V		R523	1-216-113-00	METAL CHIP 470K 5% 1/10W	
				R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
				R525	1-216-031-00	METAL CHIP 180 5% 1/10W	
				R526	1-216-748-11	METAL CHIP 39K 1% 1/10W	

The components identified by mark
 △ or dotted line with mark △ are
 critical for safety.
 Replace only with part number
 specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< VARIABLE RESISTOR >				< FLAT CABLE >			
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K		W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K		W573	1-690-606-11	CABLE, FLAT (FFC-32) 8P	
RV502	1-241-497-11	RES, ADJ, METAL GLAZE		*****			
RV503	1-238-096-11	RES, ADJ, CERMET 1M		MISCELLANEOUS			
RV503	1-238-862-11	RES, ADJ, CERMET 1M		*****			
RV504	1-238-092-11	RES, ADJ, CERMET 47K		11	1-550-743-11	HOLDER, BATTERY	
RV504	1-238-858-11	RES, ADJ, CERMET 47K		25	1-542-126-41	MICROPHONE UNIT	
RV505	1-238-086-11	RES, ADJ, CERMET 470		30	1-241-771-11	RES, VAR (FOCUS RING)	
RV505	1-238-852-11	RES, ADJ, CERMET 470		36	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
< SWITCH >				△57	1-451-310-21	DEFLECTION YOKE (B/W)	
S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT (+))		105	1-692-025-11	SWITCH, PUSH	
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT (-))		117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
< TRANSFORMER >				134	1-547-558-21	FILTER BLOCK, OPTICAL	
△T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK		135	1-547-540-11	LENS, ZOOM (VCL-6110WA) (TYPE I)	
< THERMISTOR >				135	1-547-561-21	LENS, ZOOM (VCL-6110WC) (TYPE II)	
TH501	1-809-350-21	THERMISTOR, NTC (2125)		351	1-547-540-11	LENS, ZOOM (VCL-6110WA) (TYPE I)	
< FLAT CABLE >				361	1-547-561-21	LENS, ZOOM (VCL-6110WC) (TYPE II)	
W502	1-526-978-51	SOCKET ASSY, CRT		IC901	A-7030-340-A	CCD ASSY (AUTO) (CCD IMAGER)	
*****				M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
*	A-7071-632-A	VK-22 BOARD, COMPLETE (AEP/UK)		M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
		*****		M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
*	A-7071-677-A	VK-22 BOARD, COMPLETE (AUS)		M904	3-708-385-01	IRIS ASSY (TYPE I)	
		*****		M904	3-708-486-01	METER ASSY, IG (IRIS) (TYPE II)	
		(Ref, No 5, 000 Series)		M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
< CONNECTOR >				M905	3-708-489-01	MOTOR ASSY, AF (FOCUS) (TYPE II)	
CN571	1-691-487-21	CONNECTOR, FFC/FPC 8P		M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P		M906	3-708-487-01	MOTOR ASSY, PZ (ZOOM) (TYPE II)	
* CN575	1-580-055-21	PIN, CONNECTOR 2P		S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
< DIODE >				S002	1-572-987-11	SWITCH, PUSH (3KEY)	
D570	8-719-820-05	DIODE 1SS181				(REC PROOF, ME/MP, MP/MP-HG)	
< SWITCH >				S005	1-570-771-21	SWITCH (C DOWN)	
S570	1-572-498-11	SWITCH, SLIDE (EJECT)		△V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)		*****			
S572	1-572-921-31	SWITCH, KEY BOARD (FF)		ACCESSORIES & PACKING MATERIALS			
S573	1-572-921-31	SWITCH, KEY BOARD (PB)		*****			
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)		1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE) (UK)		
S575	1-572-498-11	SWITCH, SLIDE (REC) (AUS)		*	1-693-017-11	REMOTE COMMANDER (CAM CODER) (RMT-509)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)			3-712-673-01	SCREWDRIVER (UK)	
				*	3-754-318-01	INSTRUCTION (AEP, UK)	
					3-754-385-11	MANUAL, INSTRUCTION (ENGLISH) (AEP, UK)	
					3-754-385-41	MANUAL, INSTRUCTION	
						(FRENCH, GERMAN, SPANISH) (AEP)	
					3-754-385-51	MANUAL, INSTRUCTION	
						(DUTCH, SWEDISH, ITALIAN) (AEP)	
					3-754-385-61	MANUAL, INSTRUCTION (PORTUGUESE) (AEP)	

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
	3-754-385-71	MANUAL, INSTRUCTION (DANISH, FINNISH)	(AEP)
	3-755-132-51	MANUAL, INSTRUCTION (ENGLISH)	(Australian)
	3-941-737-01	BELT, SHOULDER	
*	3-947-110-71	INDIVIDUAL CARTON	
*	3-947-111-01	CUSHION, ACC	
*	3-947-112-01	CUSHION (LOWER)	
	3-947-500-01	LID, BATTERY CASE	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA) (UK)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E) (AEP)	
	A-6768-255-A	RFU ADAPTOR (RFU-90AS) (Australian)	
**	AC-V60A	AC POWER ADAPTOR	
***	NP-55H	BATTERY PACK	

Note.

- ** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
- *** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

SECTION 7

CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 204.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Stabilized power supply
- Vectorscope
- Adjusting driver
- Color monitor
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part) ^{Note 1}	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	Flange back check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-31 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-71 board (For the video section adjustment)
	Extension cord (20P, 0.8 mm)	J-6082-169-A	For extension of VA-71 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-61 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-45, VK-22 boards) (For the video section adjustment)
	Extension cord (8P, 0.8 mm)	J-6082-173-A	For extension of cabinet L (PJ-45, VK-22 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

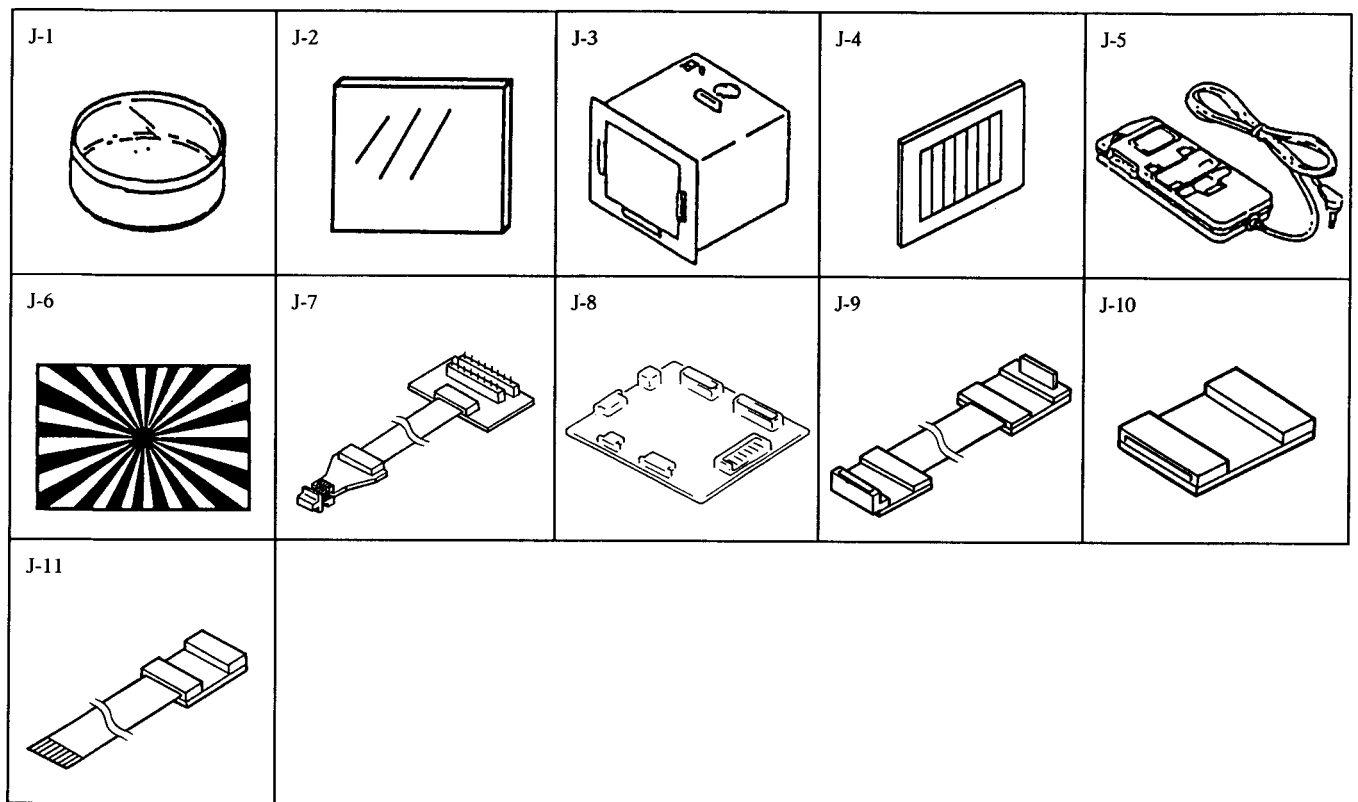


Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

- 1) Connect the equipments for adjustment as shown in Fig. 7-3.

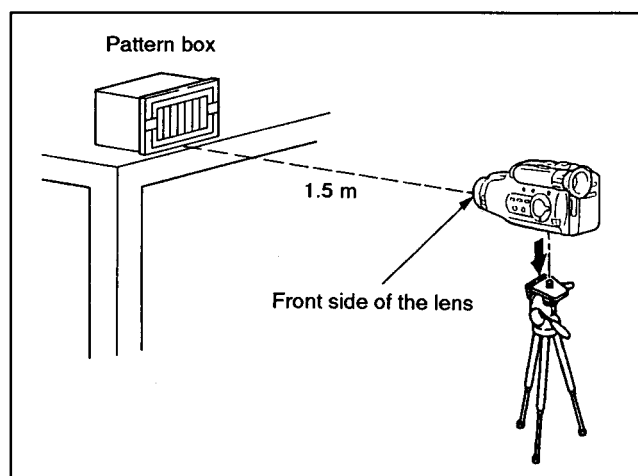


Fig. 7-2.

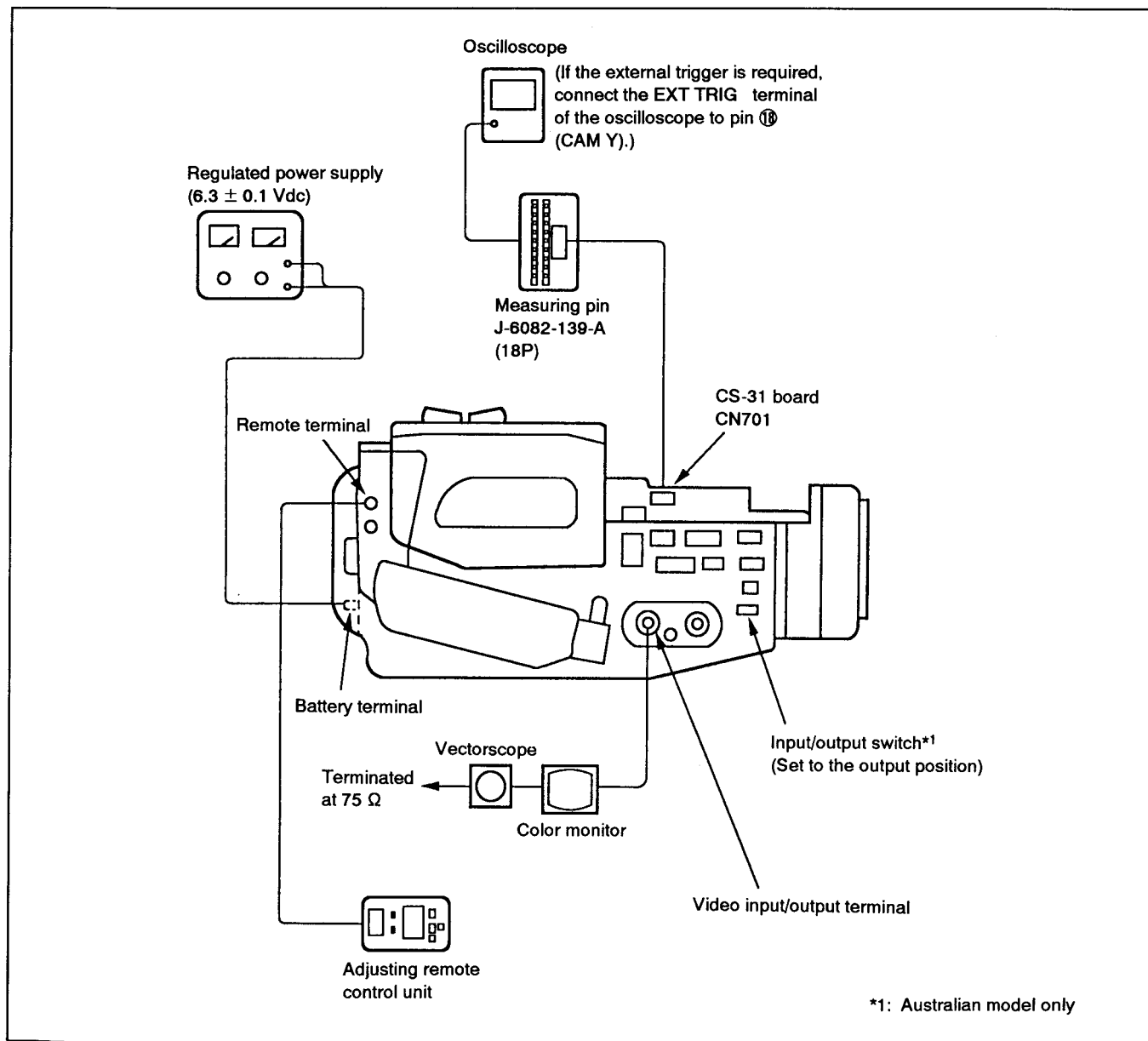


Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/video power switch (PK-30 board S540) Camera
2. Standby switch (SW-200 board S581) Standby
3. AE dial (CK-47 board S560) OFF
4. Input/output switchover switch (PJ-45 board S551)*1
..... Output
5. Back light button (CK-47 board S567) Off

*1 : Australian model only.

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

- 1) Color bar chart (Standard picture frame)
Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
(Standard picture frame)
- 2) White pattern (Standard picture frame)
Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart
(Standard picture frame).

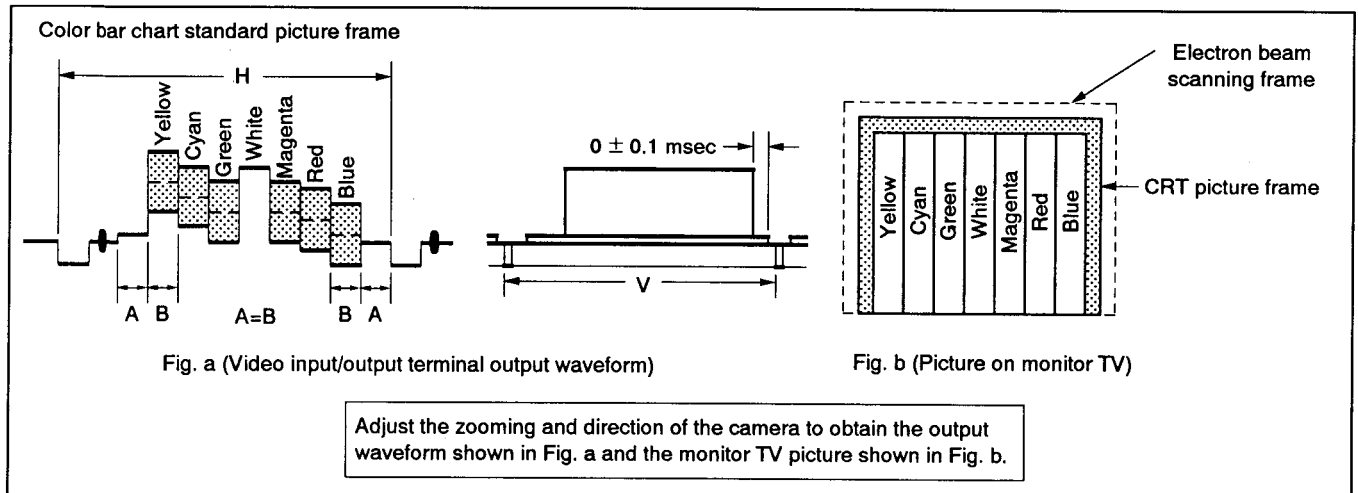


Fig. 7-4.

3) Chart for flange back adjustment

Combine a white A0 size (1189 mm × 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

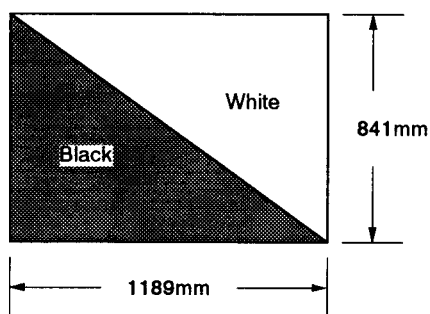


Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-31 board IC702). These processes are carried out by the camera micro processor (CS-31 board IC709). This micro processor reads the data written in the non-volatile memory (CS-31 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

- 1) Connect the adjusting remote control unit to the remote terminal (PS-282 board J951).
- 2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

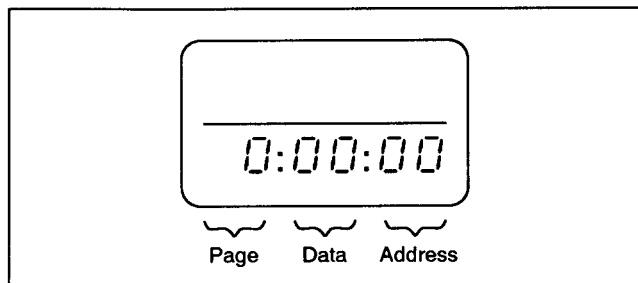


Fig. 7-6.

- 3) Operate the adjusting remote control unit as follows.

- Changing the page

The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH- button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

- Changing the address

The address will increase when the FF (▶▶) button is pressed, and decrease when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.

- Changing the data (Data setting)

The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.

There are altogether 256 data, from 00 to FF.

- Writing the adjustment data

It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.

(The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)

- 4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
(To adjust the titler system (D page), adjust the data of page: 1, address: 00 to 01, and release the protect of page D.)
- 5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data							
			Initial value	Memo column						
00	ID	Set ID	00	2B						
01	FADER LEVEL	AE REF level modification during fader	E0	E0						
02	FADER ENDTIM	The setting of the AE REF modulation time during fader	10	10						
03	CS SL	Carrier balance adjustment	35							
04	VSUB	CCD imager V SUB adjustment [IC702 ③]	80							
05	VPGH	CCD imager VRG adjustment [IC702 ④]	80							
06	VREF Y	Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]	7B							
07	VREF C	Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]	99							
08	HALL GAIN	Hole amplifier gain adjustment [IC702 ⑦]	HALL adjustment							
09	HALL OFFSET	Hole amplifier offset adjustment [IC702 ⑧]		71						
0A	E LOWLIGHT START	Low luminance intensity REF level modulation start setting	30	30						
0B	REF 2V	2V standard voltage for hole element [IC702 ⑩]	68	68						
0C	AD REF	Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]	72							
0D	CORE DETH	CCD correction control	04	04						
0E	CORE VTR DELAY	1HDL longitudinal setting during VTR playback	16	16						
0F	CORE APCN4	Horizontal aperture setting	A5	A5						
10	CORE APCN5	Vertical aperture setting	3D	3D						
11	CORE EFECT	Special effect control	A8	A8						
12	CORE MATR	BLUE matrix constant	27	27						
13	CORE MATB	RED matrix constant	6C	6C						
14	CORE BURST LEVEL	Burst flag level setting, color modulation ON/OFF	38	38						
		<table><tr><td>Data</td><td>Adjustment modeAdjustment</td></tr><tr><td>38</td><td>Normal level</td></tr><tr><td>2E</td><td>Color modulation stopped</td></tr></table>			Data	Adjustment modeAdjustment	38	Normal level	2E	Color modulation stopped
		Data			Adjustment modeAdjustment					
		38			Normal level					
2E	Color modulation stopped									
15	CORE CHROMA DLY	Y/C delay adjustment	03	03						
16	CORE Y SETUP	Set up level setting	03	03						
17	CORE VHAPCN	Slice and level setting of the aperture signal	17	17						
18	CORE B-Y GAIN	B-Y GAIN	Color reproduction adjustments	13						
19	CORE R-Y GAIN	R-Y GAIN		11						
1A	CORE R-Y HUE	R-Y HUE		FF						
1B	CORE B-Y HUE	B-Y HUE		FD						
1C	CS/APCCUT	Low luminance intensity aperture and chroma suppress level	22	22						

Table 7-2 (1).

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	00	
1E	CCD DEFECT0	CCD correction data	00	
1F	CCD DEFECT1	CCD correction data	00	
20	CCD DEFECT2	CCD correction data	00	
21	CCD DEFECT3	CCD correction data	00	
22	CCD DEFECT4	CCD correction data	00	
23	CCD DEFECT5	CCD correction data	00	
24	CCD DEFECT6	CCD correction data	00	
25	CCD DEFECT7	CCD correction data	00	
26	CCD DEFECT8	CCD correction data	00	
27	CCD DEFECT9	CCD correction data	00	
28	CCD DEFECT10	CCD correction data	00	
29	CCD DEFECT11	CCD correction data	00	
2A	CCD DEFECT12	CCD correction data	00	
2B	CCD DEFECT13	CCD correction data	00	
2C	CCD DEFECT14	CCD correction data	00	
2D	RREF L	3200k Red standard data LSB	72	
2E	RREF H	3200k Red standard data MSB	5F	
2F	GREF L	3200k Green standard data LSB	D4	
30	GREF H	3200k Green standard data MSB	63	
31	BREF L	3200k Blue standard data LSB	3B	
32	BREF H	3200k Blue standard data MSB	2C	
33	RCONTREF	3200k RCONT adjustment value	42	
34	BCONTREF	3200k BCONT adjustment value	4A	
35	AWB NOWM R	Red regular correction coefficient	7E	
36	AWB NORM B	Blue regular correction coefficient	96	
37	AWB SHUT IN	Indoor determination shutter data	A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data	A0	A0
39	AWB IRIS IN	Indoor determination hole data	79	
3A	AWB IRIS OUT	Outdoor determination hole data	7F	
3B	AWB G LEVEL	High luminance section green integral level	02	02
3C	AWB G WIDTH	High luminance section green integral level range	03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient	00	
3F	AWB SELECT	AWB mode selection	00	00
40	AWB DIFF	Standard difference from the outdoor fixed value	0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient	48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient	78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient	60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient	40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient	66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient	18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient	66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient	18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value	C2	C2

Table 7-2 (2).

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data									
			Initial value	Memo column								
4A	AWB BOTTOM DWN	AWB incoming frame bottom lower value	94	94								
4B	AWB MIDDLE UP	AWB incoming frame middle upper value	AD	AD								
4C	AWB MIDDLE DWN	AWB incoming frame middle lower value	96	96								
4D	AWB TOP UP	AWB incoming frame top upper value	78	78								
4E	AWB TOP DWN	AWB incoming frame top lower value	60	60								
4F	AWB KEIKO	AWB incoming frame fluorescent light output lower value	6C	6C								
50	AWB KEIKO DWN	AWB incoming frame fluorescent light lower value	5C	5C								
51	AWB R TOP LMT	AWB incoming frame Rcont upper value	6E	6E								
52	AWB R DWN LMT	AWB incoming frame Rcont lower value	20	20								
53	AWB B TOP LMT	AWB incoming frame Bcont upper value	83	83								
54	AWB B IN TOP	AWB incoming frame Bcont	67	67								
55	AWB B IN MAX	AWB incoming frame Bcont	5C	5C								
56	AWB B OUT MIN	AWB incoming frame Bcont	5C	5C								
57	AWB B OUT DWN	AWB incoming frame Bcont	4A	4A								
58	AWB B DWN LMT	AWB incoming frame Bcont lower value	1B	1B								
59	AWB LL LMT	Low luminance intensity limiter	06	06								
5A	AWB T M DIVID	AWB incoming frame upper, middle border value	5B	5B								
5B	AWB B M DIVID	AWB incoming frame middle, lower border value	39	39								
5C	AWB DELAY TM	AWB tracking speed <table><tr><td>Data</td><td>Adjustment mode</td></tr><tr><td>01</td><td>High speed tracking mode</td></tr><tr><td>0A</td><td>Normal</td></tr></table>	Data	Adjustment mode	01	High speed tracking mode	0A	Normal	0A	0A		
Data	Adjustment mode											
01	High speed tracking mode											
0A	Normal											
5D	AWB FAST TM	AWB initial high speed tracking amount	40	40								
5E	AWB OUT HYS OFF	AWB outdoor hysteresis off difference	0C	0C								
5F	AWB OUT B HYS	AWB outdoor hysteresis amount	06	06								
60	AWB MODE	AWB adjustment mode <table><tr><td>Data</td><td>Adjustment mode</td></tr><tr><td>00</td><td>Normal</td></tr><tr><td>D0</td><td>AWB adjustment mode</td></tr><tr><td>F1</td><td>Sampling display mode</td></tr></table>	Data	Adjustment mode	00	Normal	D0	AWB adjustment mode	F1	Sampling display mode	00	00
Data	Adjustment mode											
00	Normal											
D0	AWB adjustment mode											
F1	Sampling display mode											
61	AE REFL	Reference value (lower) for AE	00	00								
62	AE REFH	Reference value (upper) for AE	18	18								
63	AGC MIN	AGC MIN value (AGCREF value), IRIS level adjustment	E3									
64	AE MIML	Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment	32									
65	AE MAXL	High luminance intensity side limiter (lower)	80	80								
66	IRIS OFFSET	Iris ROM table OPEN side off set	D0	D0								
67	AE KEISU	Correction coefficient during detection weighting	00	00								
68	AE FUNCTION	SW for turning each AE function ON and OFF	02	02								
69	BL HOSEIH	Forcible back light level setting (upper)	40	40								
6A	JITEISU DOWN	Constant during loop response DOWN side	28	28								
6B	JITEISU UP	Constant during loop response UP side	0D	0D								
6C	AE KNEE	KNEE setting value for AE	FF	FF								
6D	ORETEN SET	Variable point due to time constant error amount	13	13								

Table 7-2 (3).

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (Lower)	80	80
82	IRIS MIN H	Iris limit value for small iris (Upper)	02	02
83	DELTA SHUTGAIN	Smoothing amount setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower)	00	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	00	
88	TELE LIMIT	ZOOM limiter TELE (lower)	00	
89	TELE SIMITH	ZOOM limiter TELE (upper)	04	
8A	STEP ZERO	Flange back value	80	
8B	STEP ZERO SPAN (VAP ONLY)	Flange back value 2	00	00
8C	ZOOM SPD FAST	Zoom speed (fast)	1C	1C
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	89	89
8E	ZS INIT SLOW	Zoom speed initial value (slow)	89	89
8F	ZS INIT FAST	Zoom speed initial value (fast)	F0	F0
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	12	12
92	ZS L	Zoom servo coefficient L	02	02
93	ZP HYS	Zoom potential hysteresis	05	05
94	MOTOR ABILITY	Step motor MAX SPEED	08	08
95	AF MD2THL	MODE2 THR	20	20
96	MAXCHG THR	MAX value renewal THR	1A	1A
97	ERR THL	Wobbling width THR	18	18
98	WOB INTV	Wobbling second interval	04	04
99	ERRPOL THR	MODE2 error possible THR	13	13

Table 7-2 (4).

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data																	
			Initial value	Memo column																
9A	MAXCHK THR	MAX CHECK THR	12	12																
9B	REWOB THR	Wobbling second THR	0A	0A																
9C	MODE2 INOUT	MODE2 speed switchover	80	80																
9D	SMLWD THR	Small frame THR	0A	0A																
9E	ZOOM PULSE LIMIT	Maximum zoom pulse value	F0	F0																
9F	ZOOM RIZE	Zoom rise minimum speed time	0A	0A																
A0	FB CURVEPEAKL	Constant for flange back adjustment	00	00																
A1	FB CURVEPEAKH	Constant for flange back adjustment	72	72																
A2	FB ZOOMSH	Constant for flange back adjustment	D2	D2																
A3	FB ZOOMSH	Constant for flange back adjustment	03	03																
A4	LIMITREST WIDE	Zoom limiter WIDE side	10	10																
A5	LIMITREST TELE	Zoom limiter TELE side	10	10																
A6	FB PEAKTHR	Constant for flange back adjustment	80	80																
A7	FB FOCUSZERO	Constant for flange back adjustment	D8	D8																
A8	DET IRIS ALT	Iris variation check THR	02	02																
A9	DET AGC ALT	AGC variation check THR	02	02																
AA	LIMIT INSURANCE	Focus limiter insurance value	05	05																
AB	FOCUS MODE	Focus mode <table><tr><td>Data</td><td>Adjustment mode</td></tr><tr><td>08</td><td>Zoom, Focus fixed</td></tr><tr><td>00</td><td>Normal</td></tr></table>	Data	Adjustment mode	08	Zoom, Focus fixed	00	Normal	00	00										
Data	Adjustment mode																			
08	Zoom, Focus fixed																			
00	Normal																			
AC	LENS ADJ MOD	Flange back adjustment mode <table><tr><td>Data</td><td>Adjustment mode</td></tr><tr><td>00</td><td>Nomal</td></tr><tr><td>01</td><td>Flange back adjustment</td></tr></table>	Data	Adjustment mode	00	Nomal	01	Flange back adjustment	00	00										
Data	Adjustment mode																			
00	Nomal																			
01	Flange back adjustment																			
AD	ELENS EMRG	Lens emergency	00	00																
AE	NTSC PAL/H DEF	DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay	23	23																
AF	FT SW	DDS display mode switchover <table><tr><td>Data</td><td>DDS display mode</td></tr><tr><td>00</td><td>Y sampling display</td></tr><tr><td>03</td><td>R-Y, B-Y display</td></tr><tr><td>40</td><td>HALL data display</td></tr><tr><td>82</td><td>R ratio display</td></tr><tr><td>83</td><td>b ratio display</td></tr><tr><td>91</td><td>R.B ratio (M) display</td></tr><tr><td>B0</td><td>Focus step display</td></tr></table>	Data	DDS display mode	00	Y sampling display	03	R-Y, B-Y display	40	HALL data display	82	R ratio display	83	b ratio display	91	R.B ratio (M) display	B0	Focus step display	00	00
Data	DDS display mode																			
00	Y sampling display																			
03	R-Y, B-Y display																			
40	HALL data display																			
82	R ratio display																			
83	b ratio display																			
91	R.B ratio (M) display																			
B0	Focus step display																			
B0	CORE OTHER		10	10																
B1	CORE YGAIN	Core field data 0 byte gain	3A	3A																
B2																				
B3																				
B4	ZOOM DROP 1	F-No. dropping (1) by zoom lens	00	00																
B5	ZOOM DROP 2	F-No. dropping (2) by zoom lens	95	95																

Table 7-2 (5).

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B6				
B7				
B8				
B9				
BA	AWB in B hys	AWB indoor hysteresis amount (B)	04	04
BB	AWB in R hys	AWB indoor hysteresis amount (R)	02	02
BC				
BD				
BE	MF STEP CHNGE	MODE 2 THR coefficient	06	06
BF	ZOOM SPEED SUPER SLOW	Zoom speed (Super slow speed)	08	08
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	89	89
C1	AF CONTROL FLAG		2C	2C
C2	AE Y THR	Low luminous intensity AE Y THR1	40	40
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	18
C4	MD2 SPD	Focus speed at MODE 2	41	41
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	30	30
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	10	10
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	20
C8-EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned.

Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (window OFF), F page write protect released Normal Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch Note: To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 1F	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 15	NTSC=1/60, PAL=1/50 NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW (10 second) ZOOM speed FAST (3.5 second) ZOOM speed SLOW (10 second)
09 ★	COMPLETED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	01 02 04	Camera micro processor ver1 Camera micro processor ver2, ver3 Camera micro processor ver4

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-31 board. Connect the

oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	CS ROM	6	CAM SO
7	CS OPD	8	CAM SCK
9	CS CORE	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this

case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0123456789A (R)B (b)C (c)D (d)E (E)F (F)															
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (R)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: () indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).

As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-282 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
-9V check	
Measurement point	Pin ⑫ of CN950
Specified value	-8.5 ± 0.4 Vdc

Checking method:

- 1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

- 1) Release the protect.
Page: 6, address: 00, data: 01.
- 2) Check that the data of page: 6, address: 09 is 00.
(Display indicating that page F data can be initialized)
- 3) Set data: 1F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Page F data initialization execution.
The data of all addresses of page F will be initialized.)
- 4) Check that the data of page: 6, address: 09 is 01.
(Displays that the initialization of page F data has been completed)
- 5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
(Releases the page F data initialization mode)
- 6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data is different from the initial data for adjustment. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	2B
14 (CORE BURST LEVEL)	38
15 (CORE CHROMA DLY)	03
16 (CORE Y SETUP)	03
5C (AWB DELAY TM)	0A
68 (AE FUNCTION)	02
6A (JITEISU DOWN)	28
6B (JITEISU UP)	0D
8C (ZOOM SPD FAST)	1C
8D (ZOOM SPD SUPER)	89
8E (ZS INIT SLOW)	89
8F (ZS INIT FAST)	F0
94 (ZOOM SPD SLOW)	08
9E (ZOOM PULSE LIMIT)	F0
AE (NTSC PAL/H DEF DELAY)	23
B0 (CORE OTHER)	10
B1 (CORE Y GAIN)	3A
BF (ZOOM SPEED SUPER SLOW)	08
C0 (ZOOM INT SUPER SLOW)	89

[Distinguishing the Camera Micro Computer (IC709) Versions]

The camera micro computer version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.5	CXP80624-299Q	05

4. 28 MHz Original Oscillation Adjustment (CS-31 board)

Subject	Not required
Measurement Point	CL821 (pin ⑤ of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14187500 $\pm$ 71 Hz

Adjusting method:

- 1) Use CT801 to adjust the oscillation frequency to 14187500 $\pm$ 71 Hz.

5. V SUB Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) $\pm$ 0.1 Vdc

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) $\pm$ 0.1 Vdc.
- 3) Press the PAUSE button of the adjusting remote control unit.

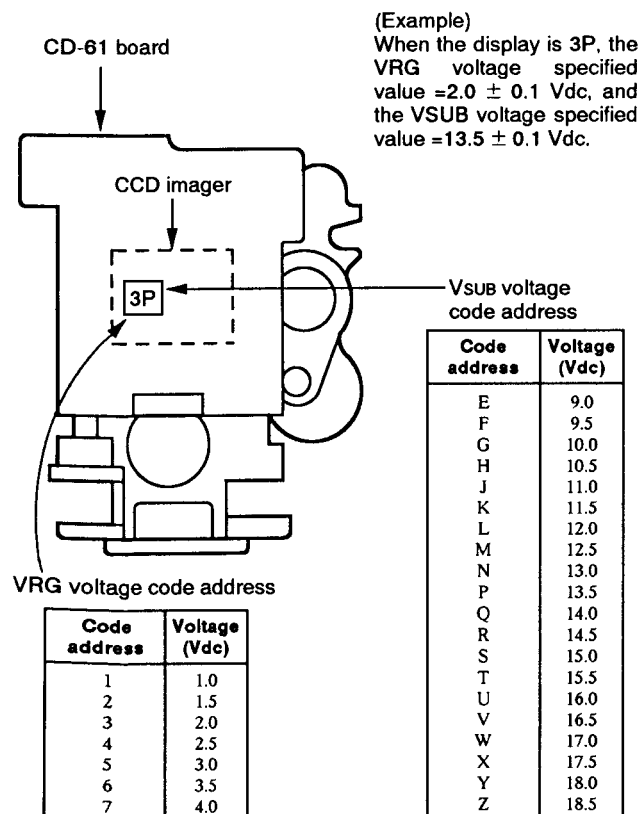


Fig. 7-7.

6. VRG Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) $\pm$ 0.1 Vdc

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) $\pm$ 0.1 Vdc.
- 3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The occasion of exchanging a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of PS-282 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Write the correction data to page: F, addresses: 1D to 2C.
Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-282 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 TO 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(HALL output display mode setting)
- 3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE mode setting)
- 4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
- 5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W₂.
- 6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
- 7) Read the DDS display data, and set to W₁.
- 8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS OPEN mode setting)
- 9) Read the DDS display data, and set to K₁.
- 10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
- 11) Read the DDS display data, and set to K₂.
- 12) Convert W₁, W₂, K₁, K₂ to decimal notation, and obtain W₁', W₂', K₁', K₂'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
- 13) Calculate X₁' using the following equations (decimal notation calculation).

$$A' = W_2' + K_1' - W_1' - K_2' \dots\dots\dots \text{Equation 1}$$

$$B' = W_1' - K_1' \dots\dots\dots \text{Equation 2}$$

$$X_1' = \frac{2048 + (48 \times A') - (16 \times B')}{A'} \dots\dots\dots \text{Equation 3}$$
- 14) Convert X₁' to hexadecimal notation, and obtain X₁.
(Round off to one decimal place)
- 15) Set data: X₁ to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
- 16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
- 17) Press the PAUSE button of the adjusting remote control unit.
- 18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE mode setting)
- 19) Read the DDS display data, and set to W₀. If W₀ lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
- 20) Convert W₀ to decimal notation, and obtain W₀'.

- 21) Calculate X₂' using the following equations (decimal notation calculation).

$$C' = W_0' - B' - 51 \dots\dots\dots \text{Equation 4}$$

$$X_2' = \frac{(128 - B') \times (X_1' - 48) + 48 \times C'}{C'} \dots\dots\dots \text{Equation 5}$$

(X₁' and B' are values obtained from equations 2 and 3)

- 22) Convert X₂' to hexadecimal notation and obtain X₂.
(Round off to one decimal place)
- 23) Set data X₂ to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
- 24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
- 25) Press the PAUSE button of the adjusting remote control unit.
- 26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS OPEN mode setting)
- 27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1m from the front side of the lens) (Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H), 8A (STEP ZERO)

Adjusting method:

- 1) Turn the auto focus off.
- 2) Adjust the focus using the focus ring.
- 3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
- 4) Release the protect.
Page: 6, address: 00, data: 01
- 5) Check that the data of page: 6, address: 09 is 00.
(Flange back adjustment possible display)
- 6) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
- 7) Set data: 01 to page: F, address: AC.
(This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
- 8) Check that the data of page: 6, address: 09 is 01.
(Display indicating flange back adjustment completion)

Processing after completing adjustments

- 1) Set data: 00 to page: F, address: AC.
- 2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D2=D1 \pm 5$ $D4=D3 \pm 5$

Checking method:

- 1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
- 2) Set data: B0 to page: F, address: AF. (Focus step display mode)
- 3) Place the Siemens star 1m from the front of the lens.
- 4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
- 5) Turn off the auto-focus.
• Checking the flange back at the center point of the zoom.
- 6) Shoot the Siemens star with the zoom TELE end.
- 7) Rotate the focus ring, and adjust the focus.
- 8) Adjust to the center point of the zoom.
(Adjust to the center point by viewing the EVF zoom) position.
- 9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D1.
- 10) Rotate the focus ring, and adjust the focus.
Read the focus step value here, and take the value as D2.
- 11) Check that $D2=D1 \pm 5$.
• Checking the flange back at the zoom WIDE end.
- 12) Shoot the Siemens star at the zoom TELE end.
- 13) Rotate the focus ring, and adjust the focus.
- 14) Adjust to the zoom WIDE edge.
- 15) Read the focus step value displayed on the TV monitor, and take the value as D3.
- 16) Rotate the focus ring, and adjust the focus.
Read the focus step value here, and adjust to D4.
- 17) Check that $D4=D3 \pm 5$.

Process after checking

- 1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑩ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	$A=150 \pm 5 \text{ mV}$

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE mode setting)
- 3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
- 4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of IRIS CLOSE mode)

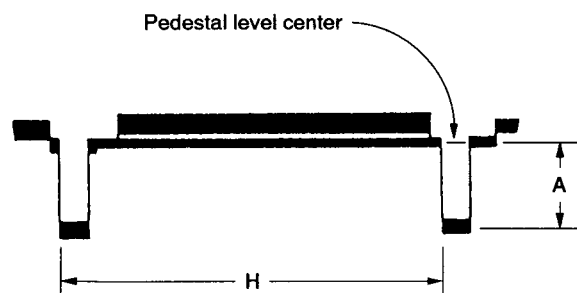


Fig. 7-8.

12. BURST Level Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	$A=150 \pm 5 \text{ mVp-p}$

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE mode setting)
- 3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
- 4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of IRIS CLOSE mode)

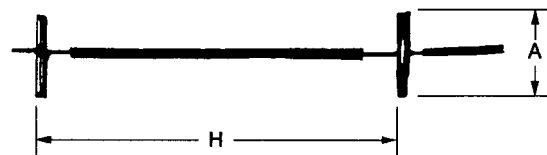


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE AGC MIN mode setting)
- 3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(Y sampling output mode setting)
- 4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
(Sets the SET UP level to 0)
- 5) Set data: 35 to page: 1, address: E6.
(Setting 1 of the sampling position)
- 6) Set data: 6D to page: 1, address: E7.
(Setting 2 of the sampling position)
- 7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
(Set the data of address 0C to the maximum value)
(satisfying the specification.)
- 8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 03 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
(Returns the SET UP level to the normal level.)
- 2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01.
- 2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE, AGC MAX mode setting)
- 3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
- 4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS NORMAL mode setting)

The center of the black luminance point should be within this circle

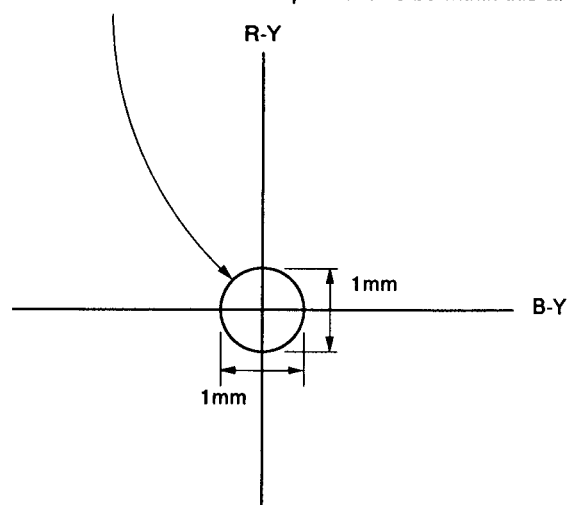


Fig. 7-10.

15. Picture Frame Setting

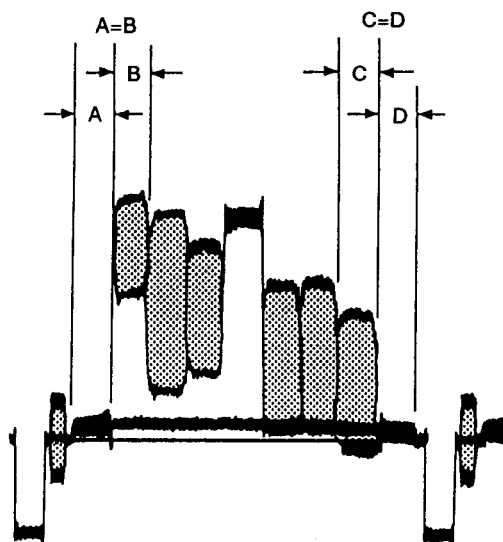
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, $t=0 \pm 0.1$ msec

Setting method:

- 1) Turn the auto focus off.
- 2) Adjust the focus using the focus ring.
- 3) Adjust the zoom and the camera direction, and set to the specified position.
- 4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

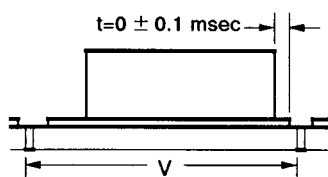


Fig. 7-11.

Check on the TV monitor

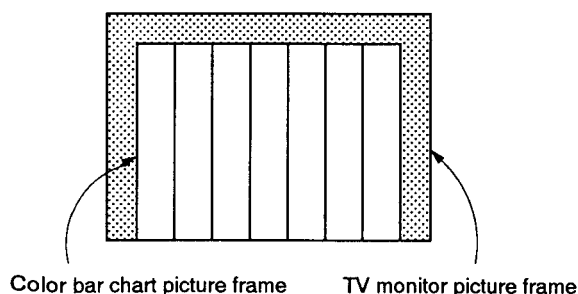


Fig. 7-12.

16. IRIS Level Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=200 ± 5 mV

Adjusting method:

- 1) Release the protect.
Page: 6, address: 00, data: 01
- 2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.

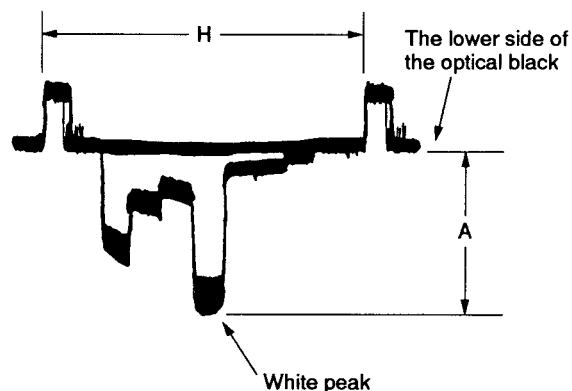


Fig. 7-13.

17. MAX GAIN Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑩ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	$A=210 \pm 5 \text{ mV}$

Adjusting method:

- 1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
- 2) Release the protect.
Page: 6, address: 00, data: 01
- 2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
- 4) Press the PAUSE button of the adjusting remote control unit.

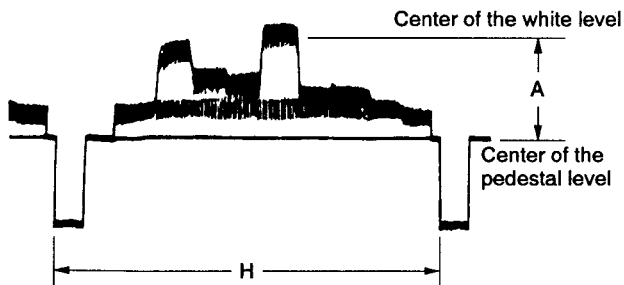


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

- 1) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
- 2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(HALL data display)
- 3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(ND0.8 shutter mode setting)
- 4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
- 5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
- 6) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(ND0.5 shutter mode setting)
- 7) Read the DDS display data and set to D3A.
- 8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

- 1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(WB 3200K preset mode setting)
- 2) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
- 3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
If not, the new data will not written to the memory.
- 4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of the preset mode)
- 2) Set data: 10 to page: 6, address: 00.
(Protect mode setting)

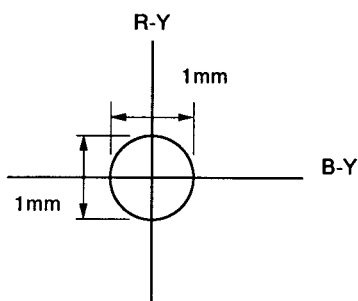


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B-Y GAIN), 19 (CORE R-Y GAIN), 1A (CORE R-Y HUE), 1B (CORE B-Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

- 1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Indoor white balance mode setting)
- 2) Set data: 01 to page: 6, address: 00.
(Camera adjustment mode (Window OFF) setting)
- 3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
- 4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.

Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
If not, the new data will not be written to the memory.

- 5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01.
(Release of the adjustment mode)
- 2) Set data: 10 to page: 6, address: 00.
(Protect mode setting)

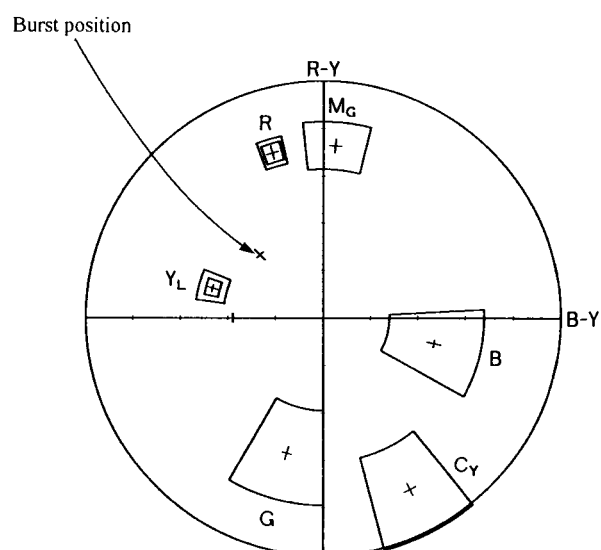


Fig. 7-16.

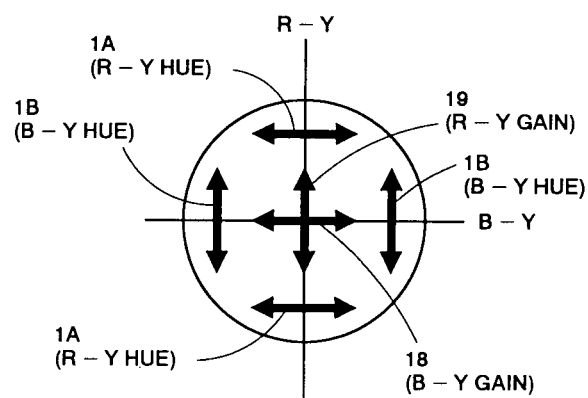


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 3O (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

- 1) Turn the power of the unit OFF/ON.
- 2) Check that the data of page: 6, address: 09 is 00.
(Auto white balance preset adjustment possible display)
- 3) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
- 5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(3200K preset data take in preparation mode)
- 6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
- 7) Check that the data of page: 6, address: 09 is 01.
(Auto white balance preset adjustment completion display)

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of the auto white balance preset mode)
- 2) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2980 ± 40 B ratio $5C80 \pm 40$

Note: Check that “Auto white balance preset adjustment” has been completed.

Adjusting method:

- 1) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
- 2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance adjustment mode setting)
- 3) Set data: 82 to page: F, address: AF.
(R ratio display mode setting)
- 4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40 .
- 5) Press the PAUSE button of the adjusting remote control unit.
- 6) Set data: 83 to page: F, address: AF.
(B ratio display mode setting)
- 7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to $5C80 \pm 40$.
- 8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
(Release of the white balance adjustment mode)
- 2) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

- 1) Check that the lens is not covered with either filter.
- 2) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
- 3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Indoor white balance mode setting)
- 4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
(Indoor white balance check)
- 5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance mode setting)
- 6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance high speed tracking mode setting)
- 7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(R, B ratio (M) display mode setting)
- 8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
- 9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
- 10) Place the C14 filter on the lens.
- 11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
(Auto white balance outdoor mode check)
- 12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
- 13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
(Auto white balance outdoor mode check)

Processing after completing adjustments

- 1) Set data: 0A to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
(Release of the auto white balance fast tracking mode)
- 2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(Release of the R, B ratio (M) display mode)
- 3) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

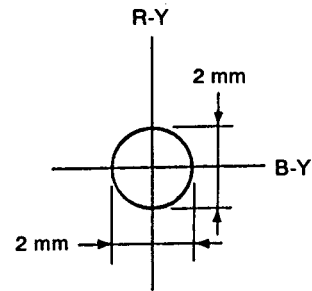


Fig. 7-18. A

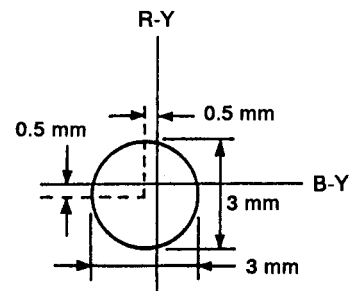


Fig. 7-18. B

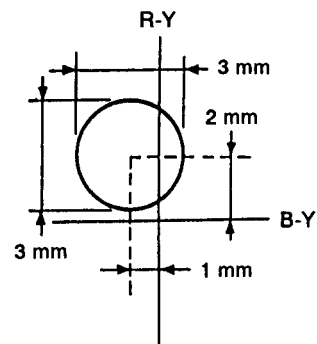


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

- 1) Remove the filter C14 for color temperature correction.
- 2) Release the protect.
Page: 6, address: 00, data: 01
- 3) Color bar data sampling mode setting
 1. Check that the data of page: 6, address: 01 is 00.
 2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
 3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
(Check that the colors on the monitor display at the color modulation stop mode have disappeared)
- 4) Specifying the Yellow position
 1. Set data: C9 to page: 1, address: E6.
 2. Set data: B6 to page: 1, address: E7.
- 5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(R-Y•B-Y data display mode setting)
- 6) Read the average value of the DDS display R-Y data (Note 2), and set to Y1.
- 7) Specifying the Red position
 1. Set data: 59 to page: 1, address: E6.
 2. Set data: 6D to page: 1, address: E7.
- 8) Read the average value of the DDS display B-Y data (Note 2), and set to R1.
- 9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
- 10) Specifying the yellow position.
 1. Set data: C9 to page: 1, address: E6.
 2. Set data: B6 to page: 1, address: E7.
- 11) Read the average value of the DDS display R-Y data (Note 2), and set to Y2.
- 12) Convert Y1, R1, Y2 to decimal notation to obtain Y1', R1' and Y2'.
(Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
- 13) Calculate X1' from the following equation (decimal notation calculation).
 $X1' = Y2' - Y1'$

- 14) Calculate D3D from the following table
(D3D is hexadecimal notation)

X1' value	D3D
$-1 \leq X1' \leq 1$	F0
$X1' > 1$	F1
$X1' < -1$	FF

- 15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
- 16) Specifying the Red position
 1. Set data: 59 to page: 1, address: E6.
 2. Set data: 6D to page: 1, address: E7.
- 17) Read the average value of the DDS display B-Y data (Note 2), and set to R2.
- 18) Convert R2 to decimal notation to obtain R2'.
- 19) Calculate X2' from the following equation (decimal notation calculation).
 $X2' = R2' - R1'$
- 20) Calculate D3E from the following table.

X2' value	D3E
$X2' \geq 0$	00
$0 > X2' \geq -1$	01
$-1 > X2'$	02

- 21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

- 1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
(Release of the sampling mode)
- 2) Set data: 38 to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
(Color modulation ON mode setting)
- 3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(Release of the R-Y•B-Y data display mode)
- 4) Turn the main power supply (6.3V) off.

Note 2: As the R-Y data and B-Y data are displayed alternatively, it will be difficult to distinguish between the R-Y data and the B-Y data.

Record this data on a tape, and perform frame advancing playback so that only the R-Y data or the B-Y data is read.

(Example)

If the frame advancing playback is performed, the following will be displayed.

6388 → 8B61 → 618B → 8A63 →

6589 → 8B60 → 608A → 8963

As the R-Y data is above 80, and the B-Y data is below 7F, the data which is underlined is the R-Y data. If the average value is calculated, the R-Y data will become 8A and the B-Y data will become 62.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at $75\ \Omega$)
Measuring Instrument	Oscilloscope
Specified Value	Y level= 680 ± 40 mV SYNC level= 300 ± 20 mV BURST level= 300 ± 30 mV

Checking method:

- 1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

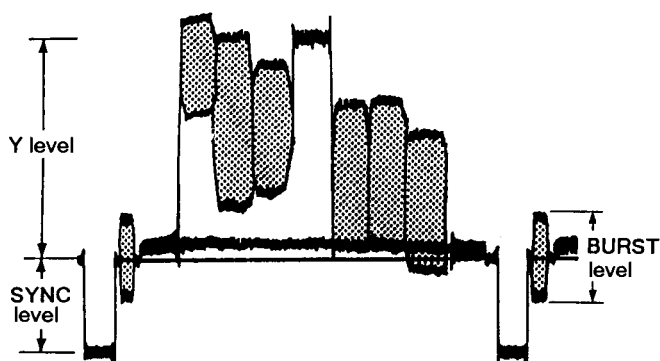


Fig. 7-19.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-21.

Adjustment method:

- 1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
- 2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-20.)
- 3) Make a picture horizontal by turning the DY.
- 4) Retighten the nut. (Do not tighten excessively.)

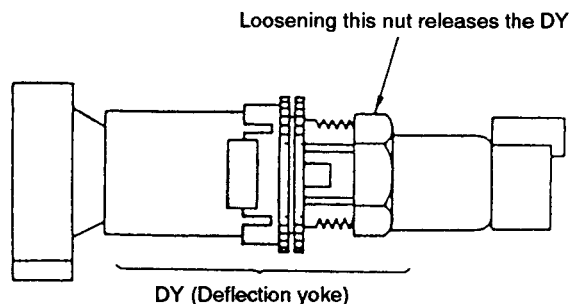
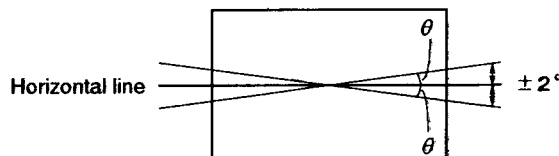


Fig. 7-20.



Specified value: Image orientation within $\pm 2^\circ$ of horizontal line.

Fig. 7-21.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-23.

Adjustment method:

- 1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-22.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

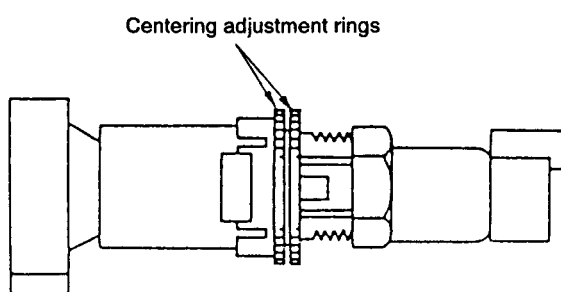


Fig. 7-22.

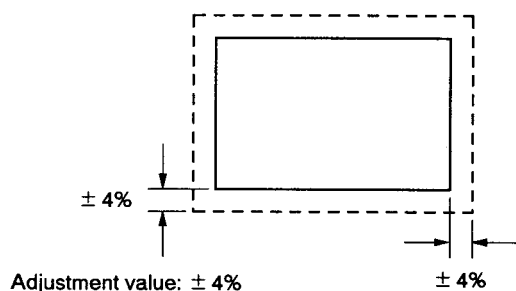


Fig. 7-23.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.3 ± 0.1 Vdc

Adjustment method:

- 1) Adjust RV504 (AFC) for 2.3 ± 0.1 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

- 1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
- 2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
- 3) Short or open the pattern **A** of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-25.)

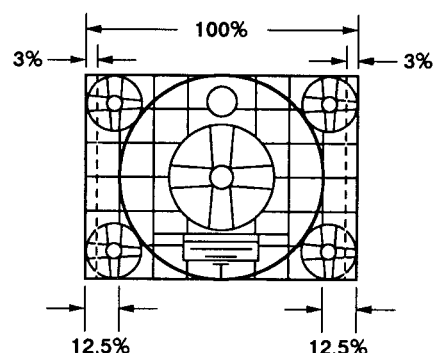
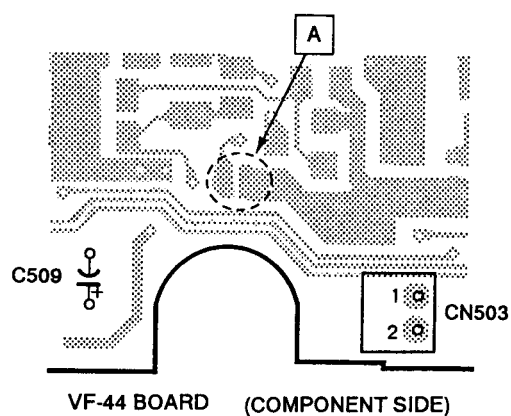


Fig. 7-24.



A section	H size
Short	Large
Open	Small

Fig. 7-25.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	6 ± 3%

Adjustment method:
1) By turning RV505 (V SIZE), adjust vertical overscan to 6 ± 3% (upper and lower total).

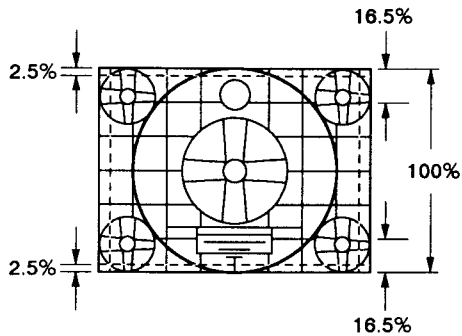


Fig. 7-26.

7-3-6. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:
1) Adjust to the best focus point with RV502.

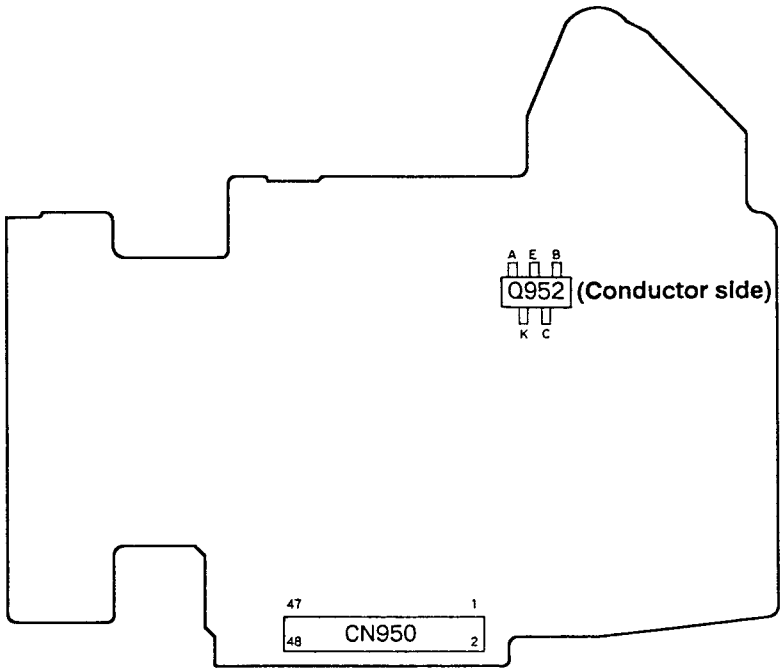
7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

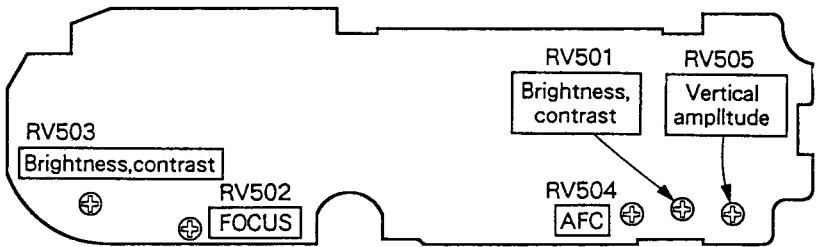
PS-282 BOARD (COMPONENT SIDE)



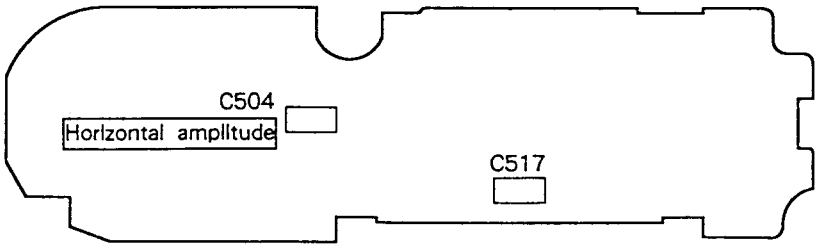
CS-31 BOARD (C)

CS-31 BOARD (C)

VF-44 BOARD (COMPONENT SIDE)



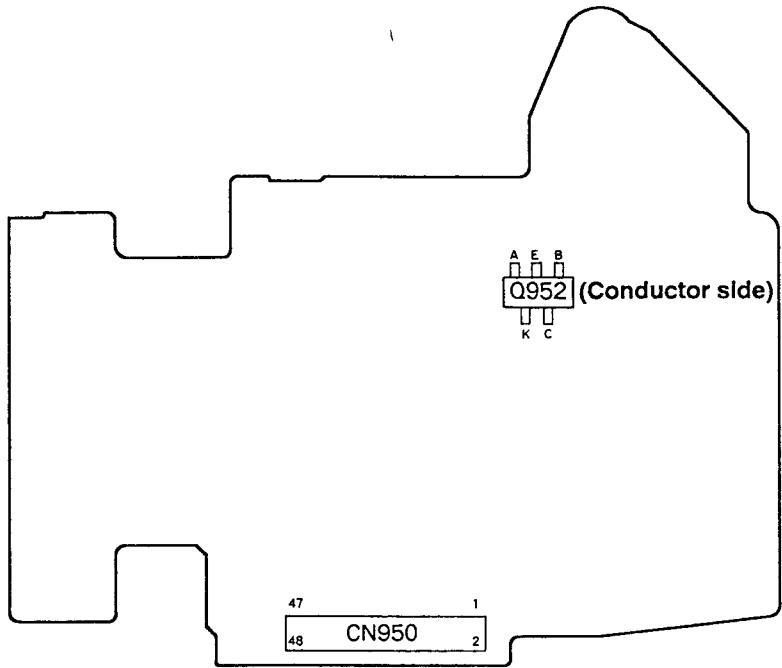
VF-44 BOARD (CONDUCTOR SIDE)



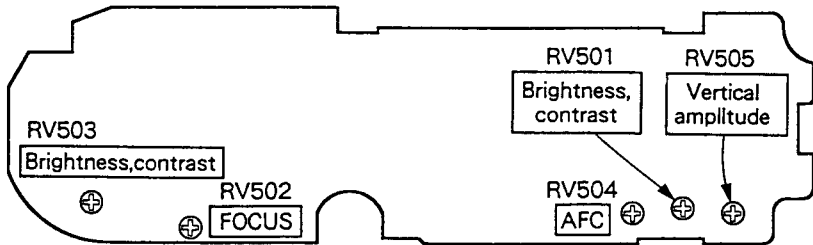
15 CN507 1

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

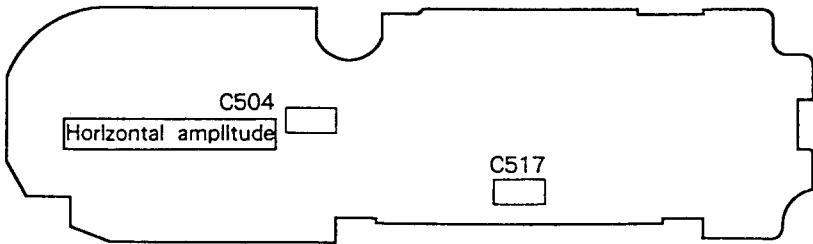
PS-282 BOARD (COMPONENT SIDE)



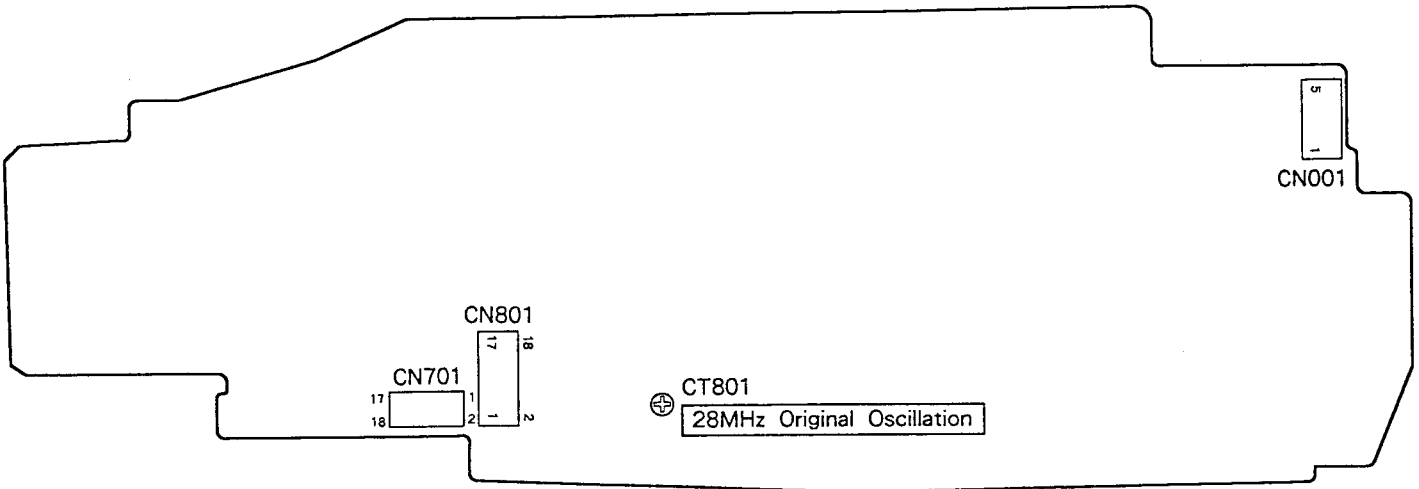
VF-44 BOARD (COMPONENT SIDE)



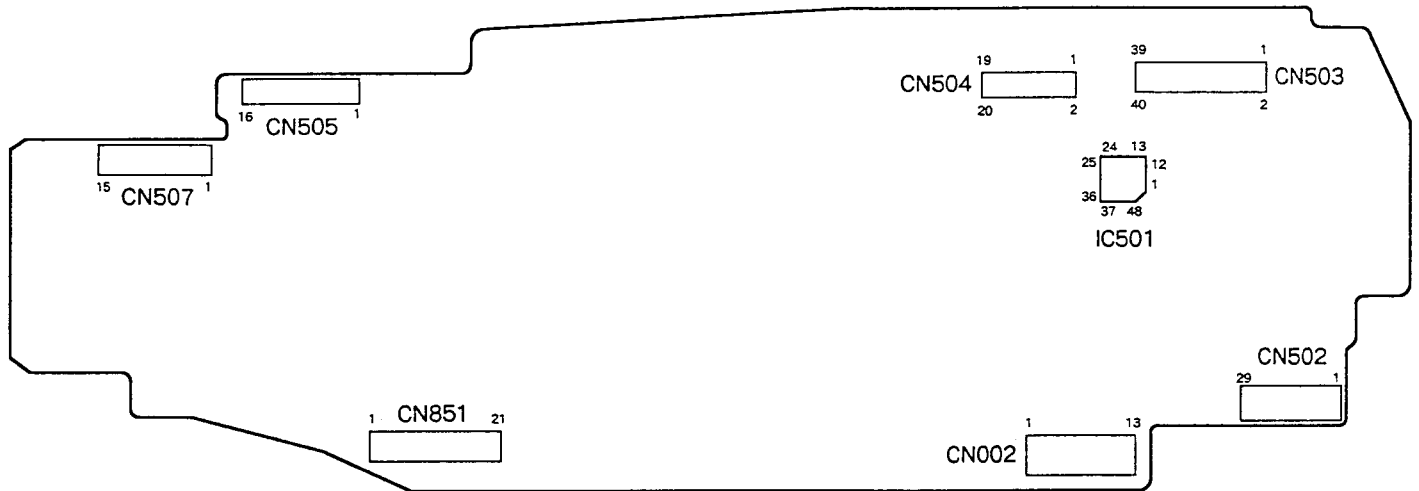
VF-44 BOARD (CONDUCTOR SIDE)



CS-31 BOARD (COMPONENT SIDE)



CS-31 BOARD (CONDUCTOR SIDE)



SECTION 8

MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

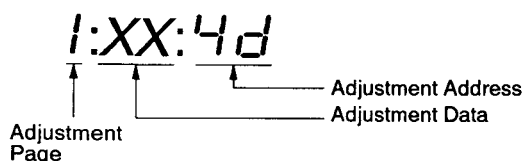
Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)
For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

- 1) Set the adjustment commander to the HOLD ON side.
- 2) Set page: 1, address: 01 and data: 01, and then release the protector.
- 3) Set page: D and address: 01.
- 4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.
(When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).
- 5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

- 1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
- 2) Connect to the oscilloscope.
CH1: CS-31 board CN001 pin ③ (PB RF)
CH2: CS-31 board CN001 pin ④ (SWP)
- 3) Play back the tracking alignment tape (WR5-1CP: 8-967-995-07).
- 4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

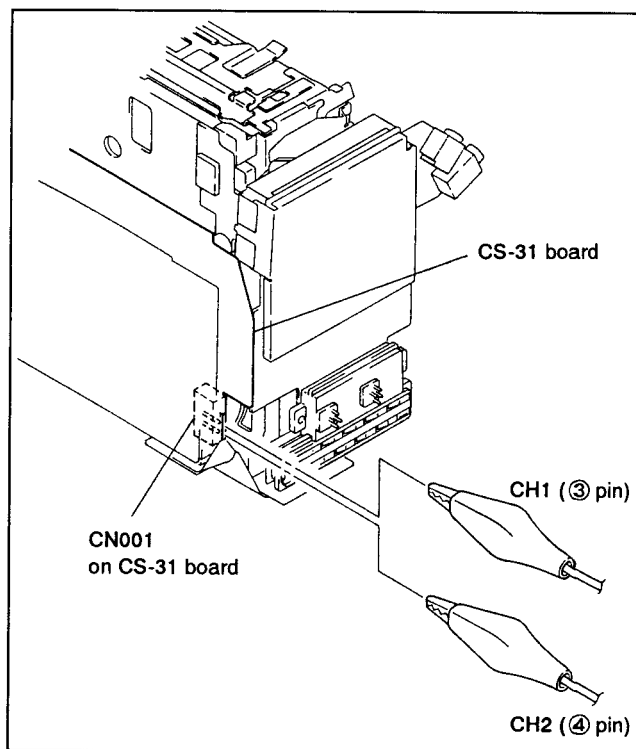


Fig.8-1.

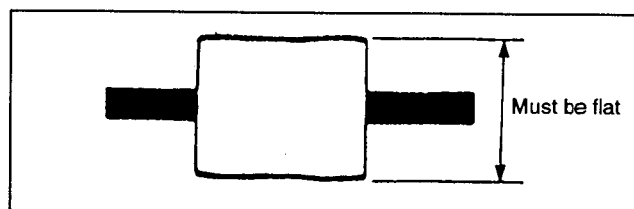


Fig.8-2.

SECTION 9 VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 238.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

9-1-1. Equipments to be used

- 1) TV monitor
- 2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
- 3) Frequency counter
- 4) Pattern generator with video output terminal
- 5) Digital voltmeter
- 6) Audio generator
- 7) Audio level meter
- 8) Audio distortion meter
- 9) Audio attenuator
- 10) Regulated power supply
- 11) Alignment tape

For tracking adjustment (WR5-1CP)

Part Code: 8-967-995-07

For video frequency characteristics adjustment (WR5-6C)

Part Code: 8-967-995-17

For checking operations

(WR5-4CL)^{Note 1}

Part Code: 8-967-995-56

(WR5-5CSP)^{Note 2}

Part Code: 8-967-995-47

Note: The following alignment tapes can also be used.

- 1) WR5-3CL (8-967-995-36)
- 2) WR5-4CSP (8-967-995-46)
- 12) Remote control unit for adjustment (J-6082-053-A)
- 13) VA-71 board extension cord (20P, 0.8 mm)
Part Code: J-6082-169-A
- 14) VA-71 board extension cord (40P, 0.8 mm)
Part Code: J-6082-168-A
- 15) Mecha deck extension cord (30P, 0.8 mm)
Part Code: J-6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/video (or player) power switch Position of the video (or player)
- Connect the adjusting remote control unit to the remote terminal (PS-282 board J951).

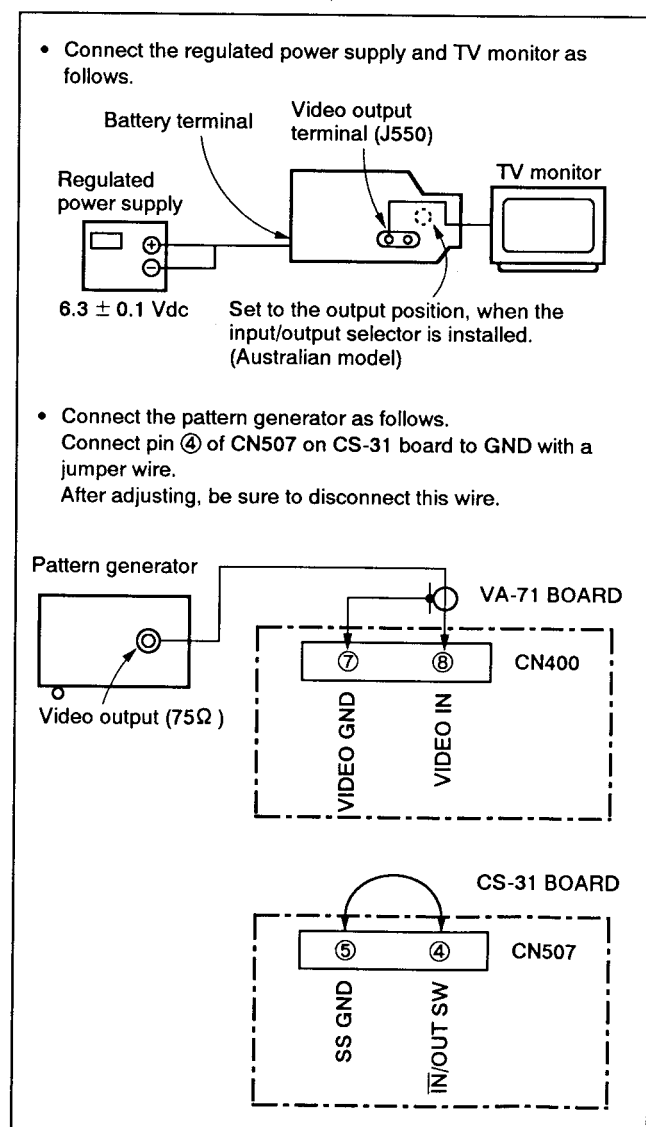


Fig. 9-1.

9-1-3. Precautions upon adjustment

The MA-93 board (Mic amplifier) is not required for adjusting the video section. Disconnect CN571 (8 pins) on VK-22 board.

- Remove the following connector if the focus ring gets in the way.
 1. CN852 of CS-31 board (8 pins)
- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
 1. CN801 of the CS-31 board (18 pins)
 2. CN851 of the CS-31 board (20 pins)
 3. CN902 of the CD-61 board (5 pins)
- Use an extension cable when opening the VA-71 board.
 1. Between CN201 of VA-71 board and CN503 of CS-31 board.
40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
 2. Between CN202 of VA-71 board and CN504 of CS-31 board.
20 pins, 0.8 mm pitch extension cable (J-6082-169-A)
- Use an extension cable when opening the CS-31 board, and when checking the operation of the mechanical section.
 1. Between CN502 of CS-31 board and FP-600 board.
30 pins, 0.8 mm pitch extension cable (J-6082-167-A)
- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
 1. CN505 of the CS-31 board (16 pins)

[How to set the forced POWER ON mode]

1. Release the protect of page D with the adjusting remote control unit.
Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/VTR (or player)) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.

Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]

1. Release the protect of page D.
Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00. (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-4. How to Set the REC Mode in the Model without REC Switch

1. REC key forbidden accept mode cancel
 1. Connect the adjustment remote controller to the REMOTE terminal.
 2. Turn on the power.
 3. Turn on the HOLD switch of the adjustment remote controller.
 4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
 5. Select the page: D address: 02, and set the data to 8F. (REC key forbidden accept mode cancel)
 6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

The REC key is accepted through the above procedure. The adjustment remote controller may be removed, hereafter.

2. REC mode setting
 1. Connect Pin ⑭ of CN507 (KEY IN 1) and Pin ⑨ of CN507 (KEY OUT 3) on CS-31 board with a jumper wire until the VTR is set to REC mode.

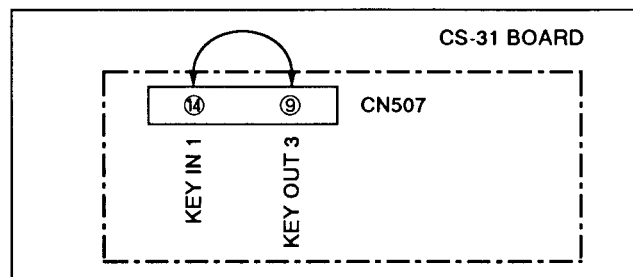


Fig. 9-2.

3. Procedure after completed the adjustment
Be sure to return the mode to REC key forbidden accept mode after adjustment.
 1. Connect the adjustment remoter controller to the REMOTE terminal.
 2. Turn on the power.
 3. Turn on HOLD switch of the adjustment remote controller.
 4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
 5. Select the page: D address: 02, and set the data to 8E. (Setting of the REC key forbidden accept mode)
 6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ⑧ of CN400 on the VA-71 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

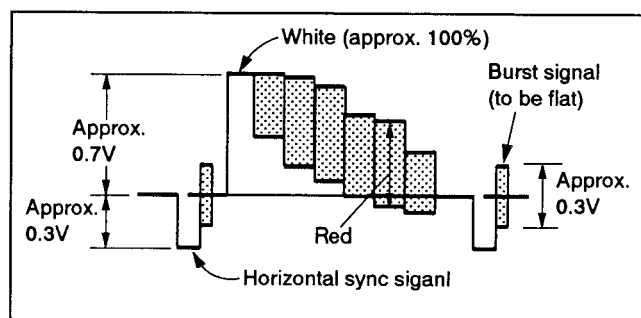


Fig. 9-3. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment.

If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record-ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1CP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6C	L	MP	LP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5CSP	L	MP	SP	- Video signal Color bar 4 minutes Monoscope 4 minutes - Audio signal (AFM) 400 Hz 60% modulation	Audio signal (PCM) Monoscope section 20 Hz 20 sec. 400 Hz 20 sec. 14 kHz 20 sec. } Color bar section Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4CL	L	MP	LP	- Video signal Color bar 4 minutes Monoscope 4 minutes - Audio signal (AFM) 400 Hz 60% modulation		

Note: Recording mode

L Conventional mode
E hi8 (hi band) mode

Tape type

MP Particle type metal tape
ME Evaporated type metal tape

Table 9-1.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure at the video output terminal (Terminated at $75\ \Omega$)

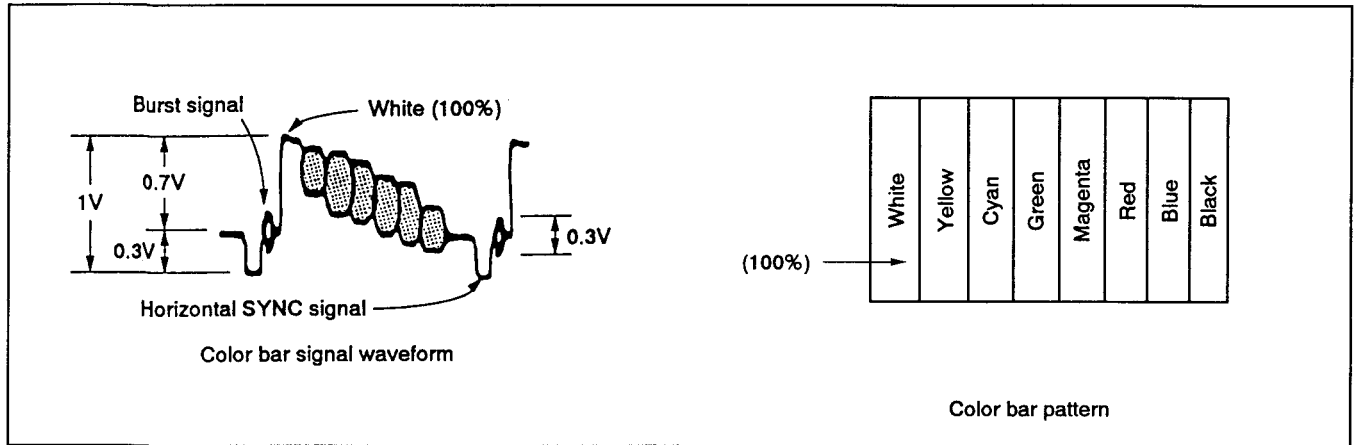


Fig. 9-4. Alignment tape color bar signal

9-1-7. Input/Output Level and Impedance

1. Australian model

[I/O level and Impedance]

Video input/output phone jack
 Input signal: 1 Vp-p, $75\ \Omega$ unbalanced, negative sync

Audio input/output phone jack
 Input level: $-7.5\ \text{dBs}$ ($0\ \text{dBs}=0.775\ \text{Vrms}$)
 Input impedance: More than $47\ \text{k}\Omega$
 Output level: $-7.5\ \text{dBs}$
 (at output impedance $47\ \text{k}\Omega$)
 Output impedance: More than $2.2\ \text{k}\Omega$

2. AEP, UK model

[I/O level and Impedance]

Video output phone jack
 Output signal: 1 Vp-p, $75\ \Omega$ unbalanced, negative sync

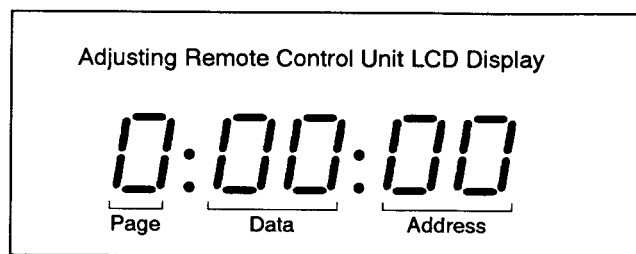
Audio output phone jack
 Specified output: $-7.5\ \text{dBs}$
 Output impedance: More than $2.2\ \text{k}\Omega$

9-1-8. Service Mode

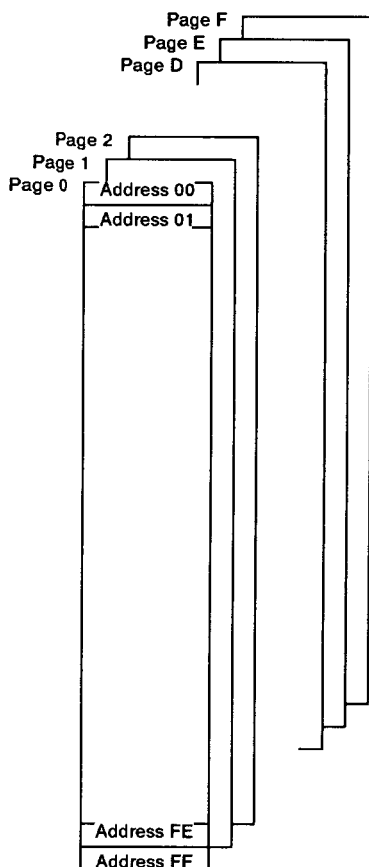
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

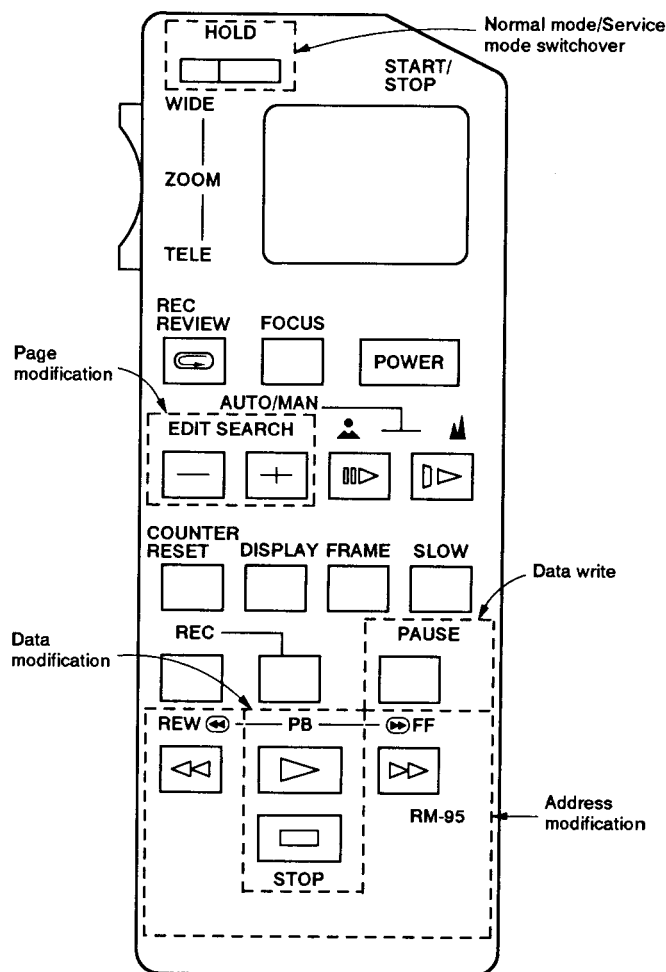
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).



(1) Service LANC memory map

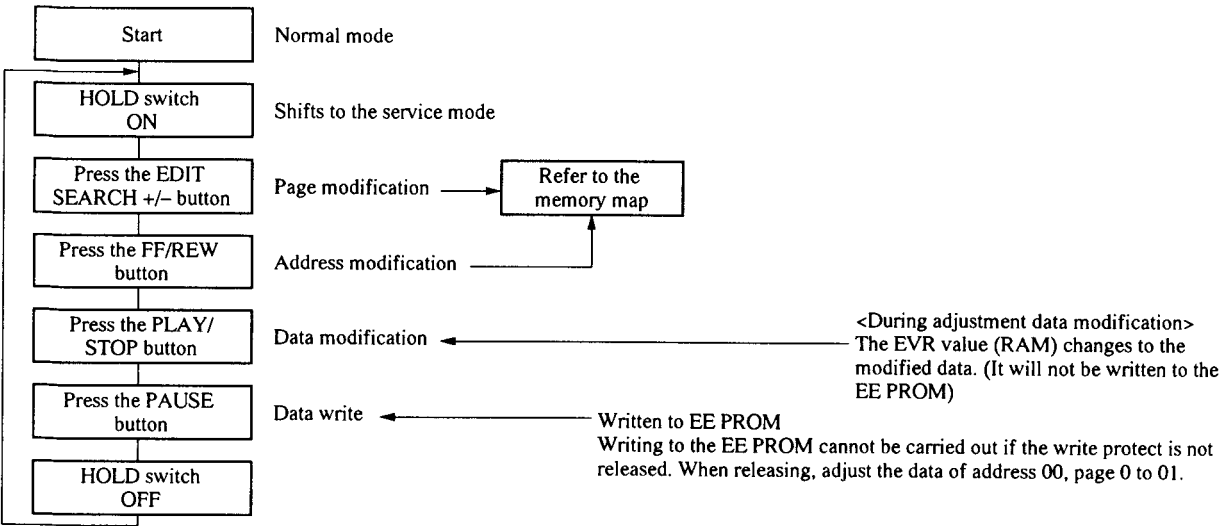


Adjusting remote control unit RM-95 (J-6082-053-A)



Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P-ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit



Command Name	Command Function	Normal LANC command
Page Up	Page +1	Edit Search +
Page Down	Page -1	Edit Search -
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address -1	Rewind
Data Up	Data +1	Play Back
Data Down	Data -1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	
	Battery DOWN adjustment	Refer to each adjustment page
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00
--------	------------

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00
--------	------------

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01
--------	------------

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06
--------	------------

First emergency code

.....The first error code generated

Page D	Address 07
--------	------------

Last emergency code

..... The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08
--------	------------

First emergency mode

.....The operation mode when the first error is generated

Page D	Address 09
--------	------------

Last emergency mode

.....The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

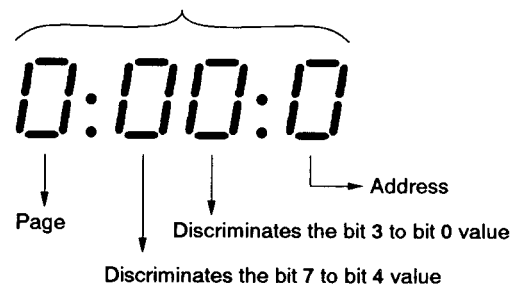
- ※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.
- ※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.
- ※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	-X1
37	-1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	-1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	-X2
77	-FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(-)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(-)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.

Adjusting remote control unit display



Remote Control Unit Display	Bit Value			
	bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ→ 8	1	0	0	0
9	1	0	0	1
A (A)	1	0	1	0
B (b)	1	0	1	1
C (c)	1	1	0	0
D (d)	1	1	0	1
Ⓑ→ E (E)	1	1	1	0
F (F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E
--------	------------

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				REC PROOF	ME/MP	Hi8/Normal	HG/Normal

"1"=Recording impossible
 "0"=Recording possible

"1"=ME tape
 "0"=MP tape

"1"=HG tape
 "0"=Others

"1"=Hi8 mode playback
 "0"=Normal mode playback

Page 1	Address 23
--------	------------

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					CC DOWN		

"0"=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D
--------	------------

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/SP

"1"=LP mode playback
 "0"=SP mode playback

"1"=SYNC is detected
 "0"=SYNC is not detected

"1"=CLOG is detected
 "0"=Normal

"1"=When the PB RF signals are being playback normally
 "0"=Others

"1"=JOG mode
 "0"=Other

"1"=Playback mode
 "0"=Others

"1"=AUDIO MUTE: ON
 "0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
 "0"=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11
--------	------------

- 1) Adjust the mechanical section to the loading completion condition.
- 2) Release the protect.
Page: 1, address: 00, data: 01
- 3) Set data: 01 to page: 4, address: 0E.
(Control permission from the adjusting remote control unit of the motor)
- 4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
- 5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

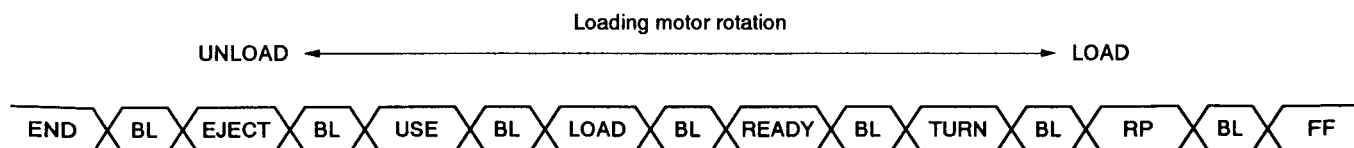
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E
--------	------------

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	CC DOWN
1	1	1	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1		Address 68~6D						
	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (-)		START/STOP	STANDBY
Address 69 (K OUT 1)		AE PORTRAT	CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)		AE SPORTS	REMOTE ON/OFF		TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)		AE SHUTTER	EVENT	TIME	DATE	PAUSE	REC	
Address 6C (K OUT 4)				BACK LIGHT	FADER			
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF						

14. Wireless Remote Control Unit Reception Content Check

Page 1		Address 1E	
Wireless remote control unit key pressed		Data	
None		FF	
TELE		9A	
WIDE		9B	
Start/stop		99	
Rewind		1B	
Fast forward		1C	
Stop		18	
Playback		1A	
Data screen		5A	
Pause		19	
SLOW		23	

15. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.

Check that these data have not been accidentally rewritten, after completing adjustments.

*1 No mark: AEP, UK model

< >: Australian model

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		8E<8F>*1	8E<8F>*1
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	16	16
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	16	16
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	16	16
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	16	16
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	16	16
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue] Not used		
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue] Not used		
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green] Not used		
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green] Not used		
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue] Not used		
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue] Not used		
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red] Not used		
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red] Not used		
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet] Not used		
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet] Not used		
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow] Not used		
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow] Not used		
20		X2MUTE, SIRCS EJECT etc	0C	0C
21		FORCED VTR ON, CAM ON etc	00	00
		DATA		
		MODE		
		01 FORCED CAMERA POWER ON		
		02 FORCED VTR POWER ON		

Table 9-2 (1).

Address	Name	Function [] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
22~29		Not used		
2A		Slow brake adjust (Forward)	00	00
2B		Slow brake adjust (Reverse)	00	00
2C		Still brake adjust	00	00
2D	BATT REMAIN 1	Amount of remaining battery	A3	
2E	BATT REMAIN 2	Amount of remaining battery	9C	
2F	BATT REMAIN 3	Amount of remaining battery	97	
30~39		Not used		
3A	MT 1'CH	Not used [IC204 ③]	C0	C0
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ⑨]	C0	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ②]	C0	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	62	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ④]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ④]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	6C	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	A4	
4D	SR-IR	IR adjustment [IC203 ②]	A4	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	9B	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	95	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	6F	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	6F	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	CF	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	69	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	81	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	93	
5C~77		Not used		
78	REC MATRIX	REC matrix adjustment [IC204 ⑫] Not used		
79	PB MATRIX	PB matrix adjustment [IC204 ⑫] Not used		
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑤]	72	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑥]	91	
7C	1.7 IR	1.7 MHz IR adjustment [IC204 ⑧] Not used		
7D	1.7 DEV	1.7 MHz deviation adjustment [IC204 ⑨] Not used		
7E	AUDIO FADER	Audio fader [IC204 ⑦] Not used		
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-282 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	464 ± 5 kHz

Adjusting method:

- 1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-282 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03±0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.00 ± 0.10 Vdc
SS 5V check	
Measurement Point	Pin ㉔ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.04 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
-9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	-8.95 ± 0.45 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-8. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7B

Input method:

- 1) Release the write protect.
Page: 1, address: 00, data: 01
- 2) Select page D, and input the initial value to each address.
(After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN 1) 2E (BATT REMAIN 2) 2F (BATT REMAIN 3)

Connection:

- 1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

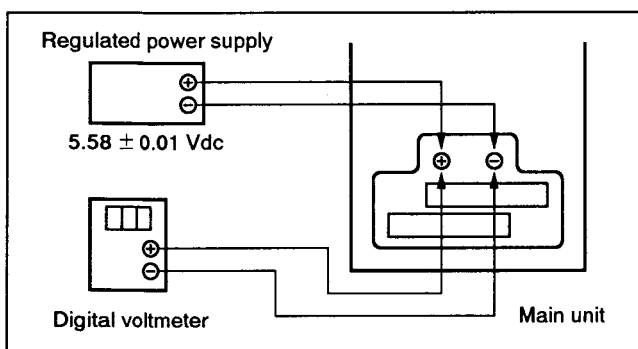


Fig. 9-5.

Adjusting method:

- 1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
- 2) Release the protect.
Page: 1, address: 00, data: 01
- 3) Set data: 01 to page: 4, address: 01.
(Test mode 1 setting)
- 4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.58 ± 0.01 Vdc.
- 5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D10.
- 6) Set data D10 to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
- 7) Convert D10 to decimal notation, and obtain D10'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
- 8) Calculate D2D', D2E' and D2F' using following equations (decimal notation calculation).

$$D2D' = D10' + 18$$

$$D2E' = D10' + 14$$

$$D2F' = D10' + 8$$
- 9) Convert D2D', D2E' and D2F' to hexadecimal notation, and obtain D2D, D2E and D2F.
- 10) Set data: D2D to page: D, address: 2D, and press the PAUSE button of the adjusting remote control unit.
- 11) Set data: D2E to page: D, address: 2E, and press the PAUSE button.
- 12) Set data: D2F to page: D, address: 2F, and press the PAUSE button.
- 13) Set data: 00 to page: 4, address: 01. (Test mode 1 release)
- 14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

- 1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

- 1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
- 2) Set to the camera recording mode.
- 3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.80 ± 0.01 Vdc.
- 4) Check that the $\square$ mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
- 5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.62 ± 0.01 Vdc.
- 6) Check that the $\square$ mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
- 7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
- 8) Check that the $\square$ mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-31 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1CP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	$t_1 = 0 \pm 10 \mu\text{sec}$

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Set data: 0B to page: D, address: 05.
- 3) Change the data of page: D, address: 05 and minimize "t₁".
(Coarse adjustment)
- 4) Change the data of page: D, address: 04, and adjust so that the switching position (t₁) becomes the specified value.
(Fine adjustment)
- 5) Press the PAUSE button of the adjusting remote control unit.

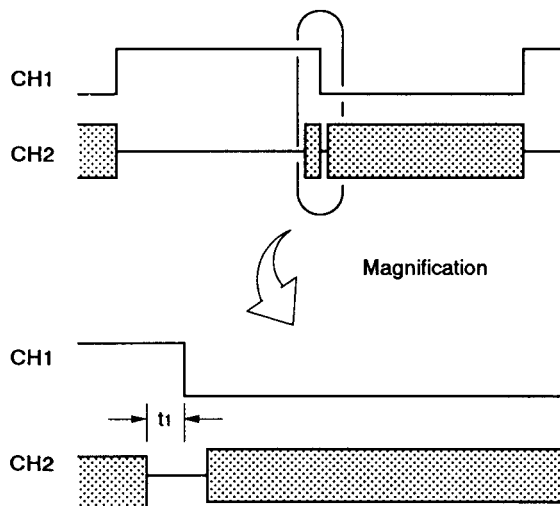


Fig. 9-6.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.

The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-3.

[Adjusting procedure]

- 1) Playback frequency characteristic adjustment
- 2) Flying erase check
- 3) VXO oscillation frequency check
- 4) EE level adjustment
- 5) IR adjustment
- 6) Chroma comb filter adjustment
- 7) Emphasis input level adjustment
- 8) PB Y level adjustment
- 9) PB LINE OUT level adjustment
- 10) Y FM carrier frequency adjustment
- 11) Y FM deviation adjustment
- 12) Chroma emphasis f₀ adjustment
- 13) REC Y level adjustment
- 14) REC C RF level adjustment
- 15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-31 board)

Note: The adjusting element for CH2 is shown in parentheses [].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6C)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [-]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

- 1) Confirm that the EDIT switch is OFF position.
- 2) Release the protect.
Page: 1, address: 00, data: 01
- 3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.

Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

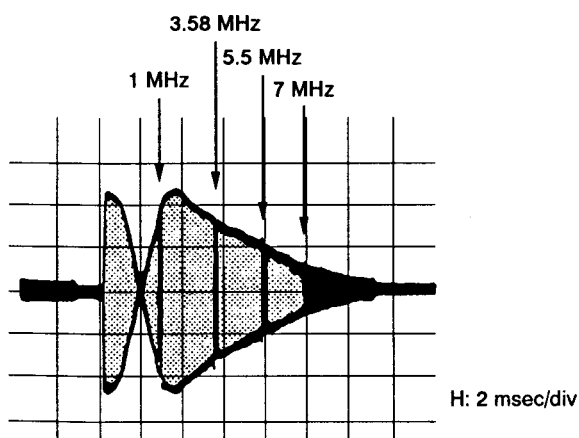


Fig. 9-7.

2. Flying Erase Check (CS-31 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.0 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

- 1) Check that the oscillation frequency is above 7.0 MHz and that the oscillation voltage is above 7.0 Vp-p.

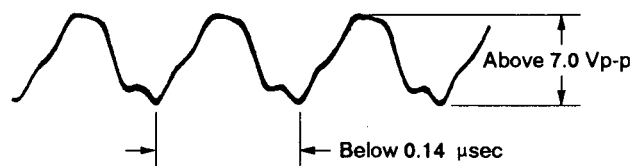


Fig. 9-8.

3. VXO Oscillation Frequency Check (VA-71 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	4433619 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately $10\text{ M}\Omega$) and low capacity (below 10 pF) buffer.

Adjusting method:

- 1) Check that the oscillation frequency of pin ⑫ of IC301 is 4433619 ± 70 Hz.

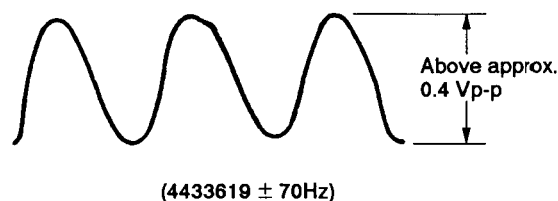


Fig. 9-9.

4. EE Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑥ of CN400 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	$A=1.00 \pm 0.025V$

Note: Terminate pin ⑥ of CN400 at 75Ω .
After completing adjustment, remove the 75Ω resistor.

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.

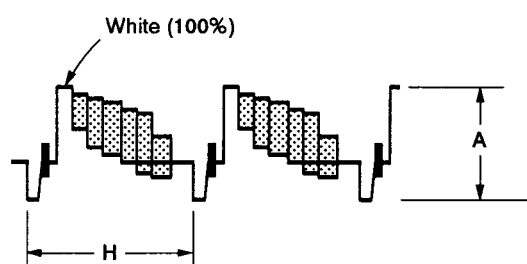


Fig. 9-10.

5. IR Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 80 mVp-p)

Connection

- 1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin ⑤ of IC201 with a jumper wire.

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
- 3) Press the PAUSE button of the adjusting remote control unit.

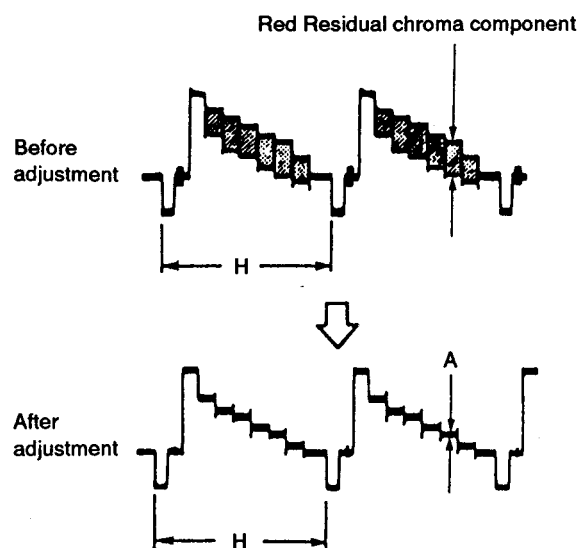


Fig. 9-11.

6. Chroma Comb Filter Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑩ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
- 3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
- 4) Repeat steps 2) through 3).
- 5) Press the PAUSE button of the adjusting remote control unit.

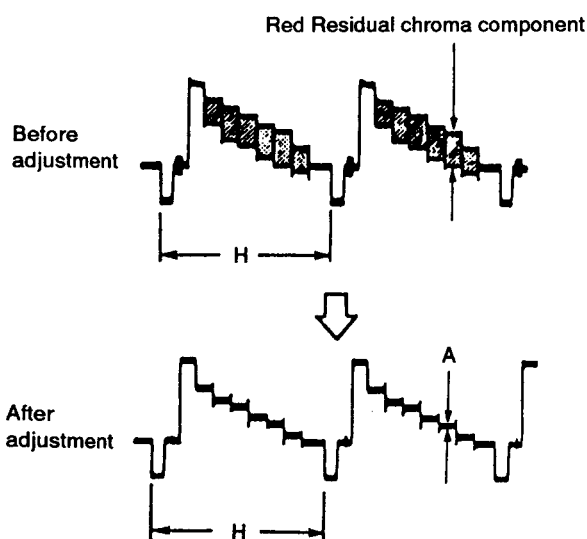


Fig. 9-12.

7. Emphasis Input Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar (without burst signal)
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	$A=0.50 \pm 0.025V$

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.

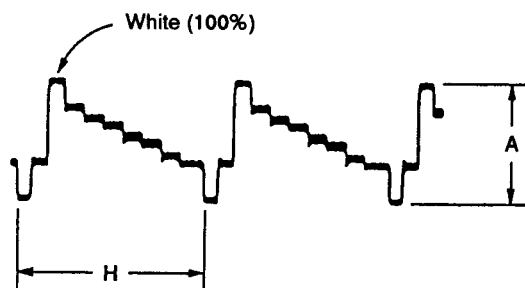


Fig. 9-13.

8. PB Y Level Adjustment (VA-71 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Pin ② of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	$A=0.50 \pm 0.025V$

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Playback the color bar section of the normal mode alignment tape (WR5-5CSP).
- 3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
- 4) Press the PAUSE button of the adjusting remote control unit.

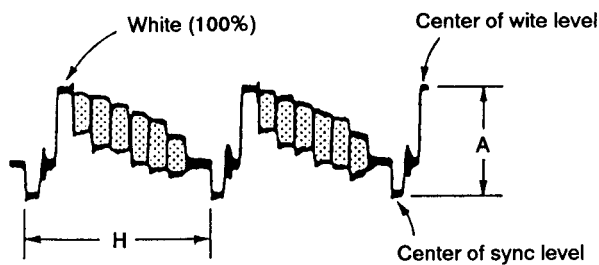


Fig. 9-14.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	$A=1.0 \pm 0.05V$

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.

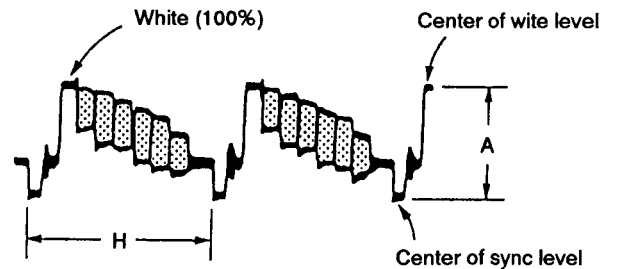


Fig. 9-15.

10. Y FM Carrier Frequency Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ④ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.
- 4) Perform "Deviation Adjustment".

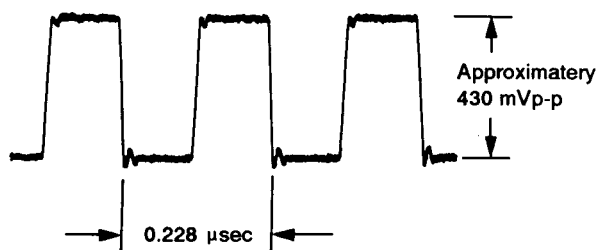


Fig. 9-16.

11. Deviation Adjustment (VA-71 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ② of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	$A=0.50 \pm 0.025V$

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Record the color bar signal.
- 3) Playback the recorded signal.
- 4) Check the playback signal level (A).
Specification: $A=0.50 \pm 0.025V$
- 5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

- 6) Press the PAUSE button of the adjusting remote control unit.

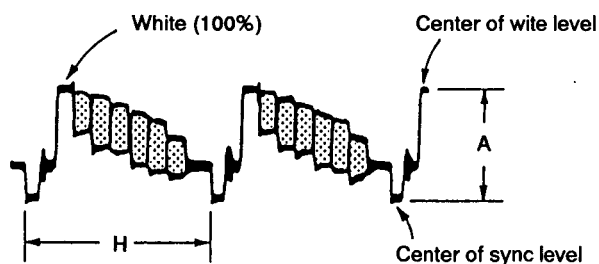


Fig. 9-17.

12. Chroma Emphasis fo Adjustment (VA-71 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ④ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum fo component

Adjusting method

- 1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

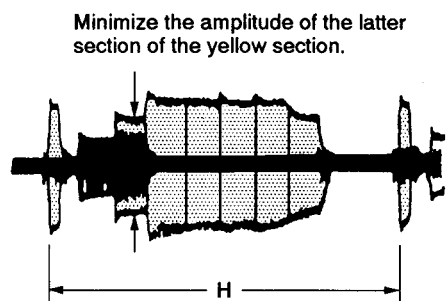


Fig. 9-18.

13. REC Y Level Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	MP type tape: $A=205 \pm 5$ mVp-p ME type tape: $A=185 \pm 5$ mVp-p

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Insert a MP type cassette tape.
- 3) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
- 4) Press the PAUSE button of the adjusting remote control unit.
- 5) Insert a ME type cassette tape.
- 6) Change the data of page: D, address: 54, and adjust so that the Y signal level (A) becomes the specified value.
- 7) Press the PAUSE button of the remote control unit.

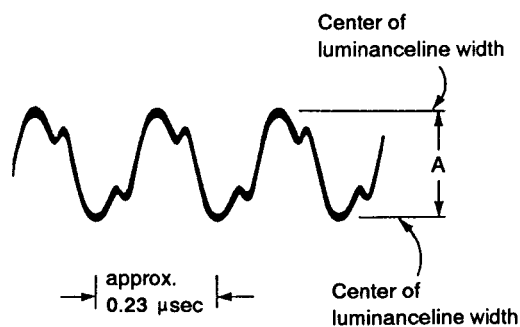


Fig. 9-19.

14. REC C RF Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46 (REC C RF (EE))
Specified Value	$A=90 \pm 10 \text{ mVp-p}$

Note: Use a MP type tape.

Adjusting method

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.
- 4) Set data: 00 to page: D, address: 47, and press the PAUSE button of the adjusting remote control unit.

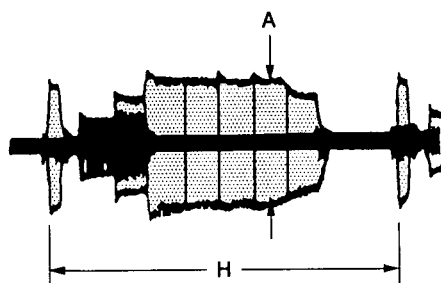


Fig. 9-20.

15. REC ATF Level Checking (CS-31 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑩ of IC501
Measuring Instrument	Oscilloscope
Specified Value	$A=600 \pm 30 \text{ mVp-p}$

Checking method

- 1) Confirm that the REC ATF signal level (A) satisfies the specified value.

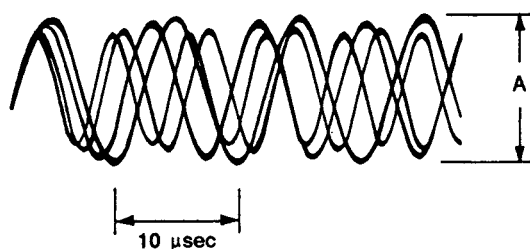


Fig. 9-21.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-22, and perform adjustments with the power switch [video or player] position.

Set the input/output select switch to the output position in Australian model.

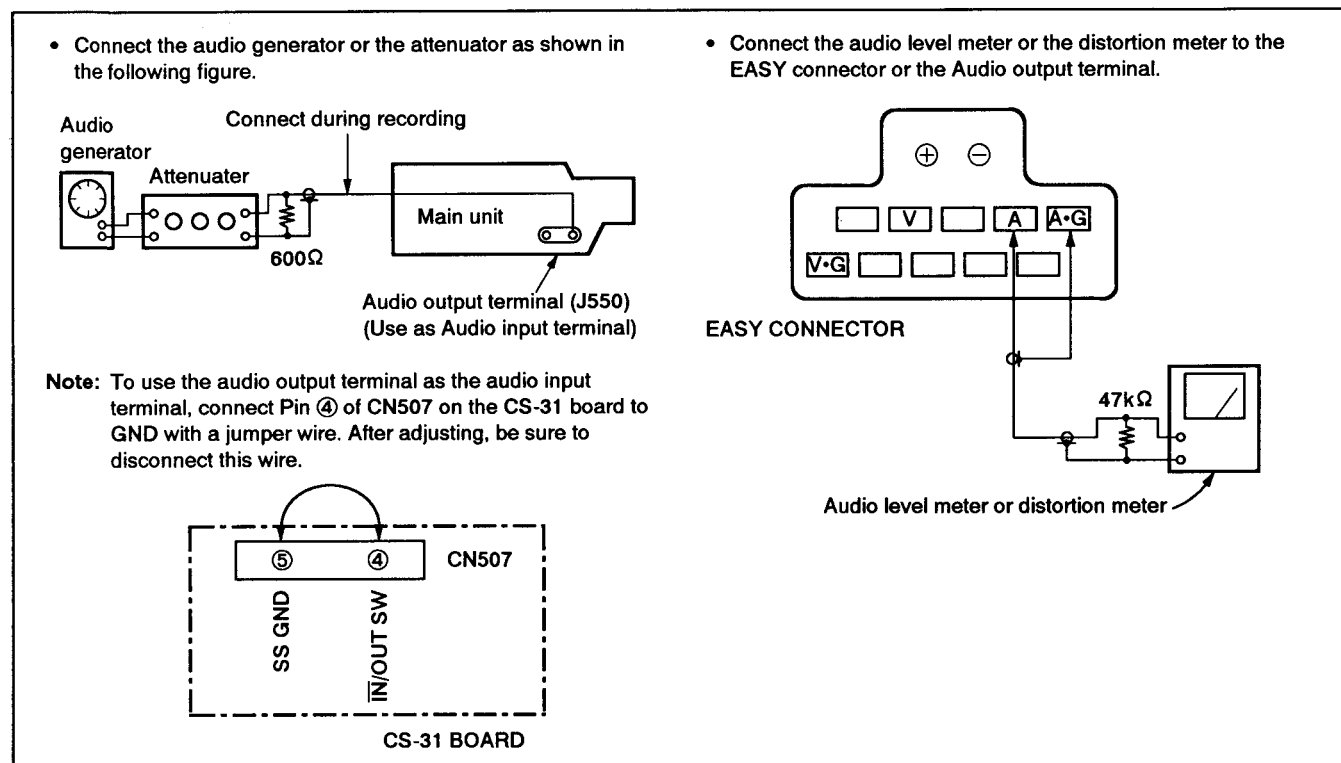


Fig. 9-22.

[Adjustment Procedure]

- 1) Carrier frequency check
- 2) Recording level check
- 3) E-E output level check
- 4) IR adjustment
- 5) Deviation adjustment
- 6) Overall level characteristics, distortion check
- 7) Overall noise level check

1. Carrier Frequency Check (VA-71 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above $1\text{ M}\Omega$) and low capacity (below 20 pF) probe.

Checking method:

- 1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. Record Level Check (VA-71 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	$A=340 \pm 40$ mVp-p

Checking method:

- 1) Check that the 1.5 MHz carrier level satisfies the specified value.
(Read the center of the luminance line width and note down the level read.)

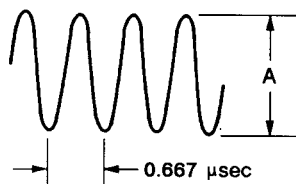


Fig. 9-23.

3. E-E Output Level Check (VA-71 board)

Mode	Record
Signal	400 Hz, -7.5 dBs audio input terminal
Measurement Point	Pin ⑩ of IC401 or Pin ① of IC400
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (-7.5 ± 2 dBs)

Checking method:

- 1) Check that the 400 Hz signal level satisfies the specified value.

4. IR Adjustment (VA-71 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP)
Measurement Point	+: Pin ⑥ of IC401 –: Pin ④④ of IC401 (C428 ⊕)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR)
Specified Value	The DC voltage difference between pins ④④ and ⑥ is 0 ± 10 mVdc

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 7A and adjust so that the DC voltage becomes 0 ± 10 mVdc.
- 3) Press the PAUSE button of the adjusting remote control unit.

5. Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5CSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	-7.5 ± 0.5 dBs

Adjusting method:

- 1) Release the protect.
Page: 1, address: 00, data: 01
- 2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
- 3) Press the PAUSE button of the adjusting remote control unit.

6. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, -7.5 dBs: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: -7.5 ± 2 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

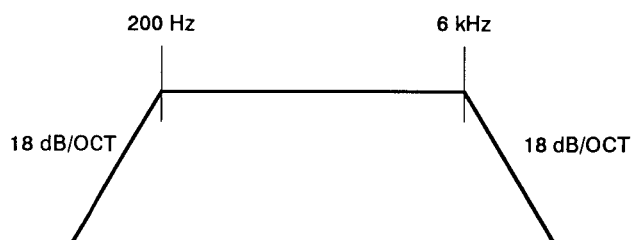


Fig. 9-24.

Checking method:

- 1) Input the 400 Hz, -7.5 dBs signal only to the audio input terminal.
- 2) Record the signal.
- 3) Remove the input signal.
- 4) Playback the recorded section.
- 5) Check that the 400 Hz signal level of the audio output terminal is -7.5 ± 2 dBs, and that the distortion rate is below 0.5% (Note 1).

7. Overall Noise Level Check

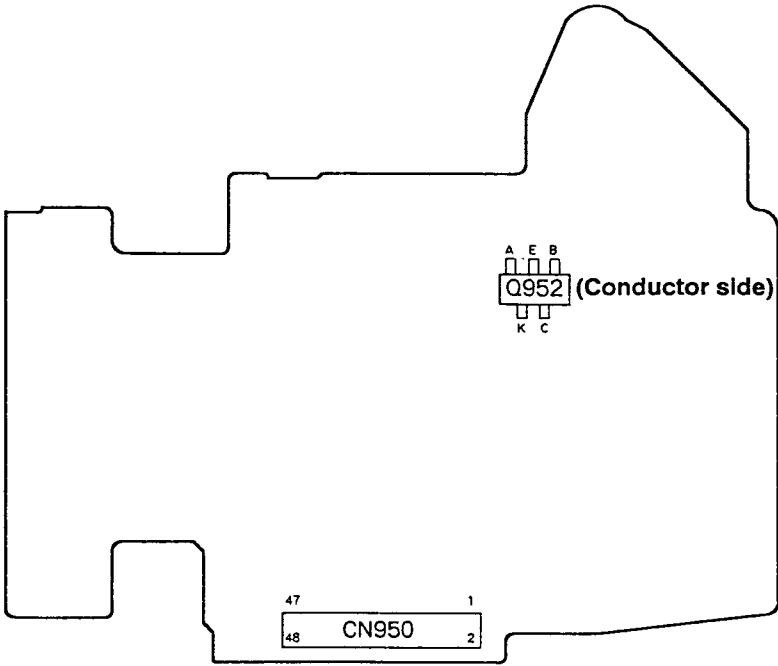
Mode	Self recording
Signal	No signal: Audio output terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below -65.0 dBs

Checking method:

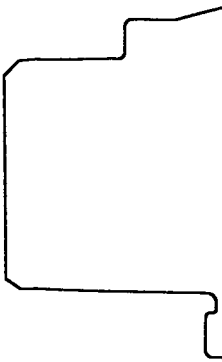
- 1) Insert the shorting plug to the audio input terminal.
- 2) Record.
- 3) Remove the shorting plug.
- 4) Playback the recorded section.
- 5) Check that the noise level of the audio output terminal is below -65.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

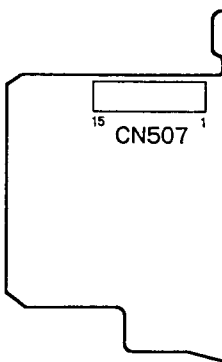
PS-282 BOARD (COMPONENT SIDE)



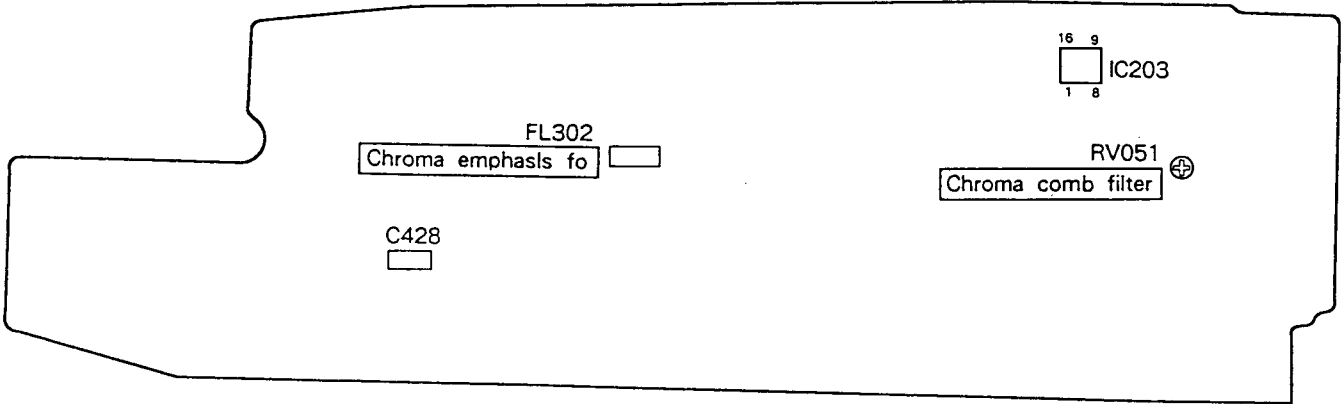
CS-31 BOARD (C



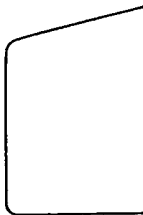
CS-31 BOARD (C



VA-71 BOARD (COMPONENT SIDE)

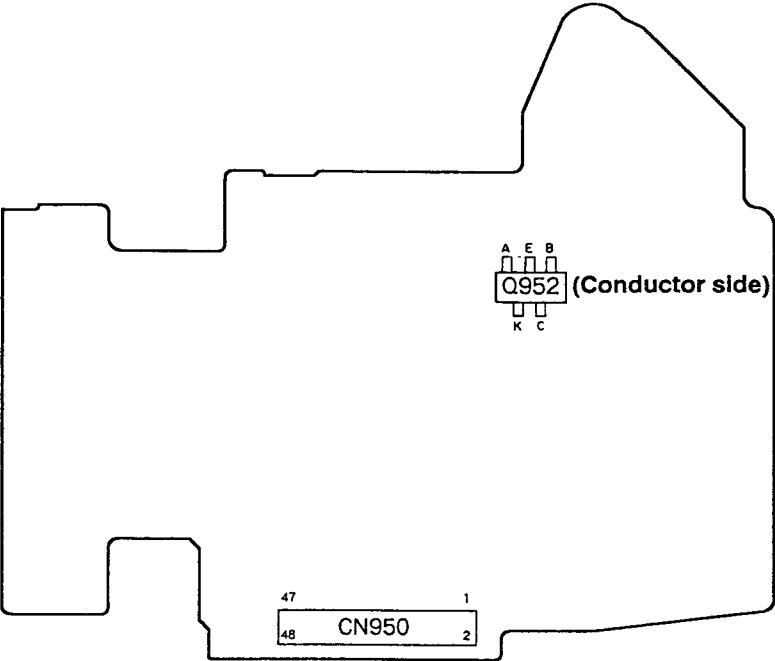


VA-71 BOA

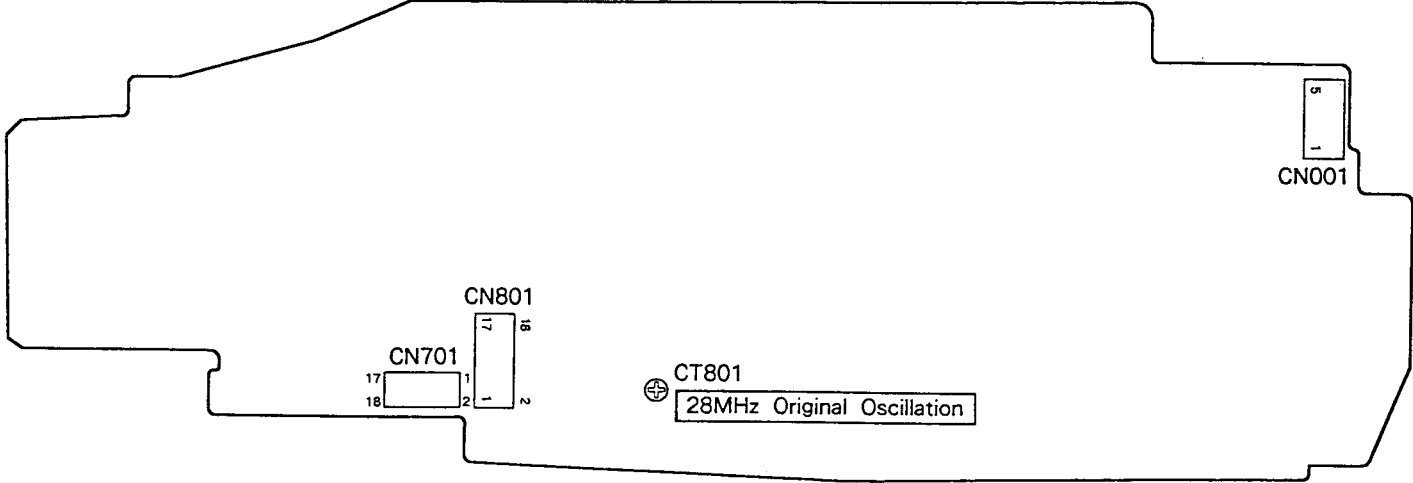


9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

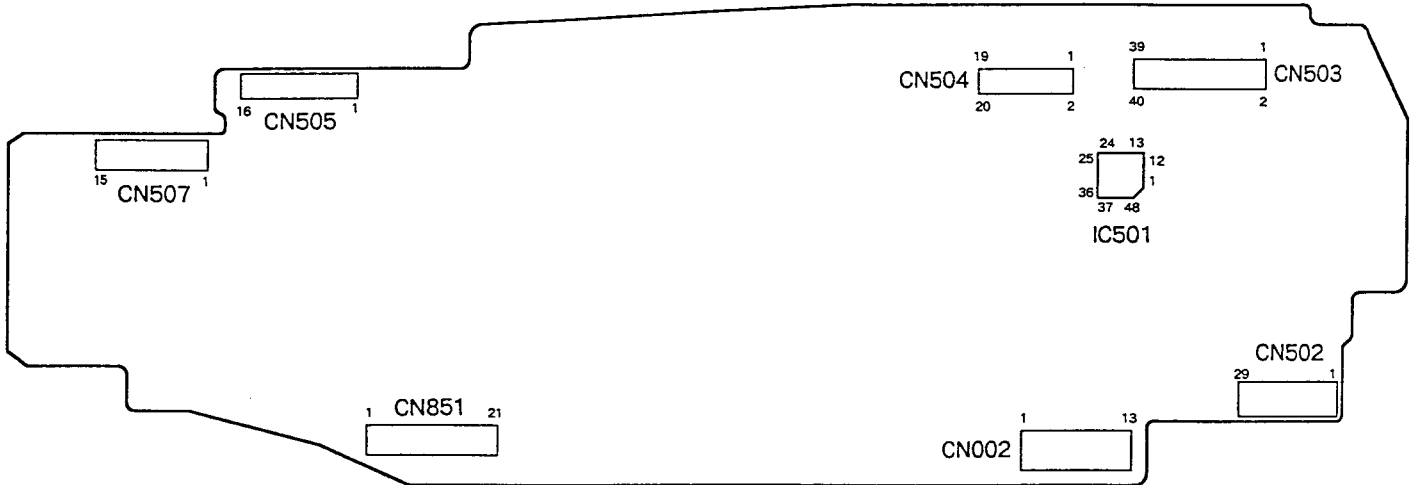
PS-282 BOARD (COMPONENT SIDE)



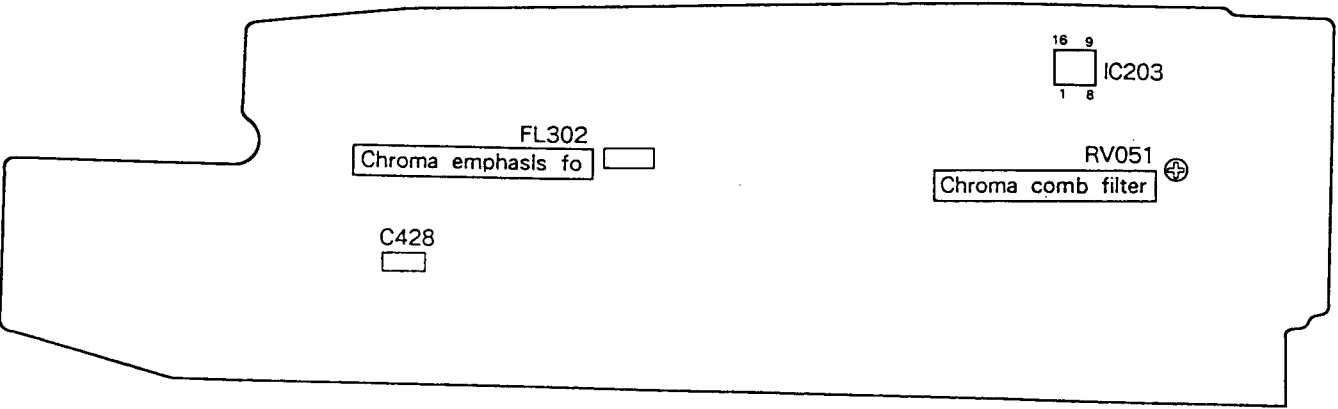
CS-31 BOARD (COMPONENT SIDE)



CS-31 BOARD (CONDUCTOR SIDE)



VA-71 BOARD (COMPONENT SIDE)



VA-71 BOARD (CONDUCTOR SIDE)

